

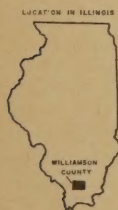
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# HOW TO KNOW YOUR SOILS AND MANAGE THEM WISELY

A PERSONAL GUIDE FOR EVERY FARMER IN WILLIAMSON COUNTY, ILLINOIS

## BROAD SOIL ASSOCIATIONS IN WILLIAMSON COUNTY, ILLINOIS



### LEGEND

FOR DESCRIPTIONS OF THESE SOIL ASSOCIATIONS SEE PART II IN FOLDER

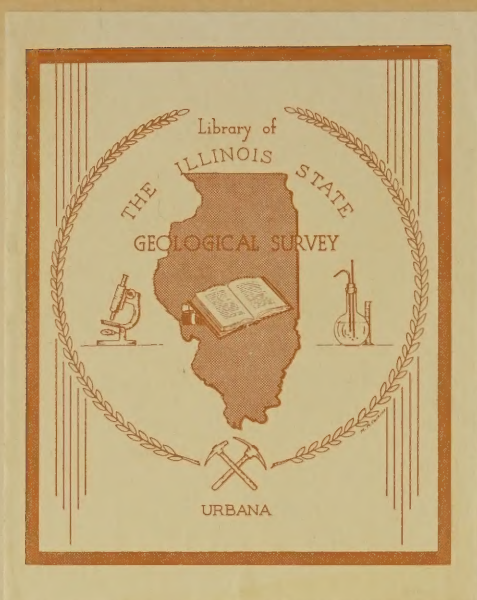
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J		COLP-HURST	Q		HOSMER-MANITOU	Z		SHARON-BELKNAP
O		AVA-BLUFORD	X		GRANTSBURG-MANITOU	T		STRIP MINE

FOR A SOIL MAP OF YOUR FARM SEE INSIDE OF THIS COVER. YOUR SOILS  
ARE DESCRIBED AND THEIR PROPER MANAGEMENT DISCUSSED ON THE ENCLOSED SHEETS.

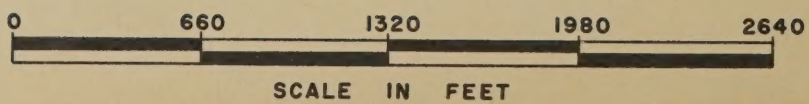
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IN COOPERATION WITH U.S.D.A. SOIL CONSERVATION SERVICE  
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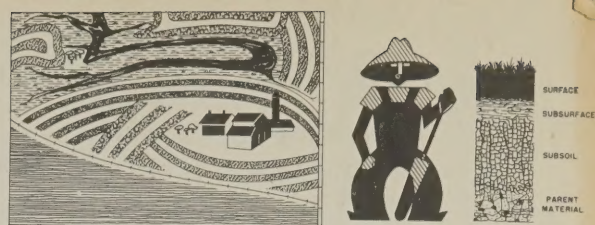


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# HOW TO KNOW YOUR SOILS AND MANAGE THEM WISELY\*

## PART I HOW TO USE THE SOIL MAP AND MANAGEMENT RECOMMENDATIONS



The material in this folder has been prepared for your use, especially to help you become familiar with your soils and to manage them for maximum returns and sustained productivity.

### Examine the Soil Map

The first step in using this report is to examine the soil map of your farm. It shows not only the location and extent of the different soil types, but also the slope of the land on which they occur and the depth to subsoil or the degree of erosion. These things are indicated by symbols consisting of three parts, arranged either horizontally (for example, 214 B 1) or vertically (for example,

214—)  
B— ) The symbols have the following meanings:  
1— )

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The *first number* indicates the soil type. In the above example, 214 refers to Hosmer silt loam. Sometimes there is a bar over the soil type number (for example  $\overline{108}$ ). This indicates that there is a high water table or serious danger of overflow.

In a few areas the letter K was used before the soil type number (for example, K214C3) to indicate the presence of numerous mine sinks.

The *letter* in the center of the symbol indicates the dominant slope of the area. The slope groups are as follows:

A=0 to 1.5 percent slope  
B=1.5 to 4 percent slope  
C=4 to 7 percent slope  
D=7 to 12 percent slope

E=12 to 18 percent slope  
F=18 to 30 percent slope  
G=More than 30 percent slope

Percent of slope refers to the number of feet change in elevation per 100 feet horizontal distance (for example, 2 percent slope = 2 feet change in elevation per 100 feet horizontal distance).

The *last number* (or + sign) in the symbol indicates depth to subsoil or degree of erosion, which is classified in the following manner:

- + =Areas where from 8 to 15 inches of soil material have been deposited in recent times on top of the natural soil surface. Also, in the vicinity of Herrin, + on small bottomlands indicates mine-wash material has covered the area.
- 0 =Depth to subsoil more than 14 inches. No apparent erosion or recent deposition.
- 1 =Depth to subsoil usually between 7 and 14 inches. Slight erosion.
- 2 =Depth to subsoil usually between 3 and 7 inches. Plow layer is a mixture of surface and subsoil. Moderate erosion.
- 3 =Depth to subsoil usually between 0 and 3 inches with the plow layer composed primarily of subsoil. Severe erosion.
- 4 =Gullied area. Very severe erosion.

On soils that are *normally* shallow to rock or subsoil the last number in the symbol refers only to the depth to subsoil, not to the degree of erosion.

In some bottomlands the letter C was placed after the last number (for example, 382AOC) to indicate a narrow, stream-cut area difficult to farm.

\* The soils of Williamson county, Illinois, were mapped by J. B. Fehrenbacher, in charge, J. D. Alexander, R. A. Bohannon, W. R. Oschwald, and R. H. Rust, University of Illinois Agricultural Experiment Station, and H. R. McCulloch, Soil Conservation Service, U. S. Department of Agriculture.

This publication was prepared by J. B. Fehrenbacher, University of Illinois Agricultural Experiment Station, and G. O. Walker, Soil Conservation Service, U. S. Department of Agriculture.



## Study "Use and Management" Sheets

After finding out what soil types occur on your farm, turn to the "Use and Management" sheets. The sheets that apply to your farm may be identified by soil type numbers. The soil type numbers, as well as soil type names, are placed in the upper left-hand corner of each sheet.

In reading what is said about each of your soils, note that the soils differ in color, texture, depth, drainage, acidity, relief, and other characteristics. Some soils, however, are enough alike that they can be used and managed in much the same way. They are, therefore, grouped together for the use and management suggestions.

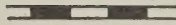

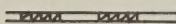
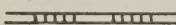

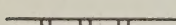
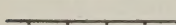
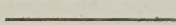
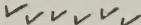
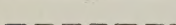

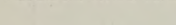

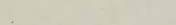




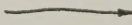





Recommended practices are based not only on the soil type but also on the slope of the land and the degree of erosion. The use and management of soils within each group may vary widely according to these factors. Therefore, it is important to keep in mind the symbols which indicate how much your land slopes and how much topsoil remains.

### Plan Your Program

The next step, after reading the use and management recommendations, is to plan an efficient program of land use and soil management for your farm. Your farm adviser or the personnel of your soil conservation district will be glad to help you. In developing your plan, remember these aspects of good management: adequate drainage; testing for soil acidity, phosphorus, and potassium; application of limestone and fertilizers; protection against erosion; and good tillage practices. *Keep your plan well-balanced, giving proper attention to each of the above aspects of soil management.* Do not emphasize one of the points and neglect others. On most farms live-stock enterprises should be included in the planning of the soil and crop management program.

As soon as a definite, well-coordinated crop and soil-management plan has been completed, it should be *put into operation*. It will pay off in continued soil productivity and good yields.

## CONVENTIONAL SYMBOLS FOR THE SOIL MAP OF YOUR FARM

	PAVED ROAD		TOWN
	PAVED ROAD (SINGLE LANE)	B. P.	BORROW PIT
	BLACKTOP ROAD		MINE
	GOB ROAD	M. D.	MINE DUMP
	GRAVEL ROAD	S. M.	STRIP MINE
	DIRT ROAD		ROCK OUT-CROP, CHIEFLY SANDSTONE
	SECONDARY DIRT ROAD AND PRIVATE ROAD		POND
	RAILROAD		SWAMPY AREA
	RAILROAD (ABANDONED)		CROSSABLE DRAINAGEWAY
	HOUSE		NONCROSSABLE DRAINAGEWAY
	SCHOOL		FLOWING STREAM
	CHURCH		DAM
	BUSINESS ESTABLISHMENT		LEVEE
	CEMETERY		



## BROAD SOIL ASSOCIATIONS IN WILLIAMSON COUNTY, ILLINOIS



Part II of this folder is concerned with the 8 broad soil associations of Williamson county shown on the front cover. It is meant primarily for those who need a general picture of soil conditions over the entire county, although it may be of interest to many others.

The loess (a silty, wind-blown deposit) from which most of the upland soils of Williamson county developed is thickest in the southwestern part of the county and thinnest in the northeastern part. On gently sloping, uneroded areas it varies in thickness from about 150 inches in the southwest to about 40 inches in the northeast. On steep slopes it may be very thin or absent in any part of the county. The main source of the loess of Williamson county was the Mississippi river floodplain during glacial times. Silty sediments left on the floodplain by glacial melt waters at floodstage were later (during periods of low water) picked up by the wind from the dry, mud-flat bottoms and deposited on the uplands.

The northern portion of the county (associations other than Q and X) was glaciated and in this part the loess is underlain by leached glacial till of Illinoian age. In Associations Q and X the loess is underlain by sandstone bedrock or by soils developed from the sandstone bedrock.

The soils of Association J are lake-bed terrace soils and are of different origin than those of the uplands. The clay or fine-textured material from which the soils of Association J developed is considered to be of Wisconsin age—a more recent glaciation than Illinoian. The Wisconsin glacier, however, reached only as far south as central Illinois but during its melting the extremely high waters of the Mississippi river flowed upstream in the Big Muddy river basin and deposited the fine-textured material over Association J. Later some wind-blown loess probably covered this area, but if so, it is not more than 6 to 24 inches thick, in general.

The bottomland association areas Y and Z are still receiving sediments and because of their youthfulness do not show much soil profile development. The sediments being deposited in Association Y are mostly from the Wisconsin age, lake-bed terraces of Association J and are slightly acid to neutral in reaction. Sediments being deposited in Association Z, since they are washed from highly leached upland soils, are medium to strongly acid in reaction.

Brief descriptions and discussions of the main characteristics of the 8 soil associations of Williamson county are given in the following paragraphs.

**Soil Association H — Hosmer and Stoy soils.** — Besides Hosmer and Stoy, Soil Association H also includes the Weir and Hickory soils. Since they have developed under forest vegetation, all of the soils of this association are light colored. Weir occurs on flats, Stoy on gentle slopes, Hosmer on moderate slopes, and Hickory on steep slopes. The loess in this area is generally over 65 inches thick except on the steeper slopes where it may be absent. On the steep slopes where the loess is absent, leached glacial till of Illinoian age is present and it is from this till that the Hickory soils have developed. On many slopes Hosmer soils that developed from loess occur on the upper portion and Hickory on the lower portion and in those areas a complex of Hickory and Hosmer soils was mapped.

The topography of Soil Association H north of Crab Orchard lake is more gentle than south of the lake. North of the lake the divides between drainageways are wider and more level and the slopes into the drainageways are, in general, shorter and not as steep as are those in the southern part of Area H.

The soils of Association H are moderately to strongly leached. They are naturally somewhat more fertile and productive than the soils of Association O. Weir is a claypan soil whereas Hosmer has a siltpan in the lower part of its profile. Stoy is intermediate in character between Weir and Hosmer.

**Soil Association J — Colp and Hurst soils.** — This association includes the Okaw, Marissa, Starks, and Camden soils as well as the Colp and Hurst soils. The entire area of Soil Association J was probably a large lake during the time when the sediments from which the soils developed were deposited. As previously mentioned high floodwaters from the Mississippi river, during the melting of the Wisconsin glacier, flowed upstream in the Big Muddy river and filled its basin with thick deposits of clay to the present level of the higher lying broad flats of Association J. Later there may have been as much as 6 to 24 inches of loess deposited on the clay and from this parent material of very thin loess on clay the Colp, Hurst, Marissa, and Okaw soils developed. Most of the Okaw is on a lower level terrace than the Colp, Hurst, and Marissa soils and probably represents a bench-like formation cut by the Big Muddy river in the lake-bed deposits. The Okaw has a very thin silty surface cover (less than 14 inches thick) over the heavy clay.



In a few areas sediments composed largely of silt and sand were deposited in Association J and from them the Starks and Camden soils developed. Starks and Camden, therefore, are more permeable and more productive than the other soils of this area. The Okaw, Hurst, Marissa, and Starks soils, in general, occur on flats whereas the Colp and Camden soils are found on slopes often where the flat, table-top benchland breaks into bottomland areas. All of these soils, except Marissa, have developed under forest vegetation and are light colored. Marissa has been partially influenced by grass vegetation and is moderately dark colored. While all of the soils of this area are acid, they are, in general, somewhat higher in available phosphorus and available potassium than are the upland soils of Williamson county. The very fine texture of the subsoils and underlying materials is the most serious handicap of the Okaw, Hurst, Colp, and Marissa soils.

**Soil Association O – Ava And Bluford soils.** – Soil Association O is the largest in Williamson county and covers most of the north and east portions, where the soils have developed from thin (less than about 65 inches thick) loess over leached Illinoian till. Besides the Ava and Bluford soils, this association also includes the Loy, Wynoose, Racoon, Creal, Blair, and Hickory soils. Loy, Wynoose, and Racoon occur on flats and are claypan soils, although in the Racoon the claypan occurs at greater depth (over 24 inches) than in the Loy and Wynoose. The Bluford, Blair, and Creal soils are found on intermediate slopes and the Ava and Hickory on the steeper slopes. Hickory has developed on steep slopes where the leached glacial till, which underlies the loess, outcrops. Slopes on which Ava occupies the upper portion and Hickory the lower portion were mapped as a Hickory-Ava complex similar to the Hickory-Hosmer complex of Association H. All the soils of Association O are light-colored, forest soils. They are highly weathered and leached and require large applications of lime and fertilizers for satisfactory crop yields. Topography in Area O is quite variable. The more level, less dissected areas are in the vicinity of Marion and in the north-central portion of the county. The rougher and more eroded areas are in the east-central and southeastern parts.

**Soil Association P – Hoyleton and Cisne soils.** – The Richview, Chauncey, and Lukin soils are included with the Hoyleton and Cisne soils in Association P. This association occurs in small, scattered areas over the northern and central parts of Williamson county on topography that is nearly level to gently sloping. Cisne and Chauncey occur on the nearly level areas and have more strongly developed claypans than the other soils of this group. Chauncey and Lukin have thicker combined surface and subsurface soil (over 24 inches) above the subsoil than does Cisne, Hoyleton, and Richview.

The soils of Association P have profile characteristics that developed under the influence of prairie grass vegetation, although some of the areas in Williamson county undoubtedly had some trees present at the time of settlement. These soils are similar in many respects to those of Association O. They differ chiefly in that the prairie grass vegetation has imparted to them a somewhat darker and thicker surface soil horizon. Like the soils of Association O, the Cisne, Chauncey, Hoyleton, Lukin, and Richview of Association P require large applications of lime and fertilizers for good crop yields. They respond well to proper soil management.

**Soil Association Q – Hosmer and Manitou soils.** – The Stoy and Wellston soils and steep rocky land (No. 9) also occur in Association Q in the southwest part of the county. In this area of loess over bedrock the valleys are deeply cut, the ridge tops are narrow, and the slopes are steep and, in general, longer than in most other parts of the county. Loess thickness on the ridge tops, from which the Stoy and Hosmer soils developed, varies from about 40 to 150 inches thick. As the slopes become steeper the loess becomes thinner. In general, the Manitou developed in loess varying from about 24 to 40 inches thick, the Wellston in loess less than 24 inches thick, and the steep rocky land shows little evidence of any loess. Rock outcrops are numerous on the steeper slopes. All of these soils are light-colored, forest soils. They are acid, low in available phosphorus, and about medium to high in available potassium. Except for the more level areas of Stoy and Hosmer on the ridge tops, this association of soils is mainly suitable for pasture and forest production.

The Hosmer of Association Q is very similar to that of Association H. It has a siltpan in the lower part of its profile in both areas. The Q and H areas were separated chiefly on topography and the differences in the soils on the steeper slopes. In Area H leached glacial till outcrops on the steep slopes whereas in Area Q sandstone bedrock outcrops or occurs at shallow depth in the soil section.

**Soil Association X – Grantsburg and Manitou soils.** – This association also includes the Robbs and Wellston soils and steep rocky land (No. 9). Association X occurs in the southeastern and eastern parts of the county and in many respects resembles Association Q. All of the soils in Area X are light-colored, forest soils and the Manitou, Wellston, and steep rocky land are the same as in Area Q. The separation of Areas Q and X was made largely on the differences between the Hosmer and Grantsburg, the two most extensive soils in each area. The Grantsburg, having developed from thinner loess in general than Hosmer, has a slightly



heavier subsoil, a more strongly developed siltpan at shallower depth, and is more highly leached and weathered. The more strongly developed siltpan at shallower depths probably means a more restricted rooting zone for plants in the Grantsburg as compared with the Hosmer.

The topography in Area X is rough and highly dissected. The more or less isolated areas of X along the eastern border of Williamson county are, generally, at higher elevations than surrounding glaciated areas of Association O. It is probable that the Illinoian glacier in this area, near its most southern extension, was weakening and unable to push over the bedrock areas at the higher elevations.

**Soil Association Y – Beacoup and Darwin soils.** – This association occurs mostly in the Big Muddy river bottomlands in the northwest part of the county where the sediments are derived largely from the Wisconsin age, lake-bed terraces of Association J. Beacoup and Darwin are slightly acid to neutral, moderately dark, fine-textured soils. They are naturally poorly drained and because of the difficulty of providing adequate drainage in this area these soils are mostly in timber. Also included in this association is a small acreage of Jacob soils. The Jacob soils are very fine-textured and differ from the Beacoup and Darwin soils in being lighter colored and more acid.

**Soil Association Z – Sharon and Belknap soils.** – Three of the soils of this association, Sharon, Belknap, and Bonnie, are light-colored, acid, medium-textured soils. They occur in the bottomlands throughout Williamson county except for the bottomland association Y in the northwest part. They are derived from sediments washed from acid, leached upland soils and differ from each other chiefly in natural drainage. Sharon is moderately well to well drained, Belknap is imperfectly drained, and Bonnie is poorly to very poorly drained.

Petrolia, the other soil in this association, is of small extent and occurs mainly in the South Fork Saline river bottoms. Like the other soils of this association it is light-colored, but it is finer textured and less acid than the Sharon, Belknap, and Bonnie.

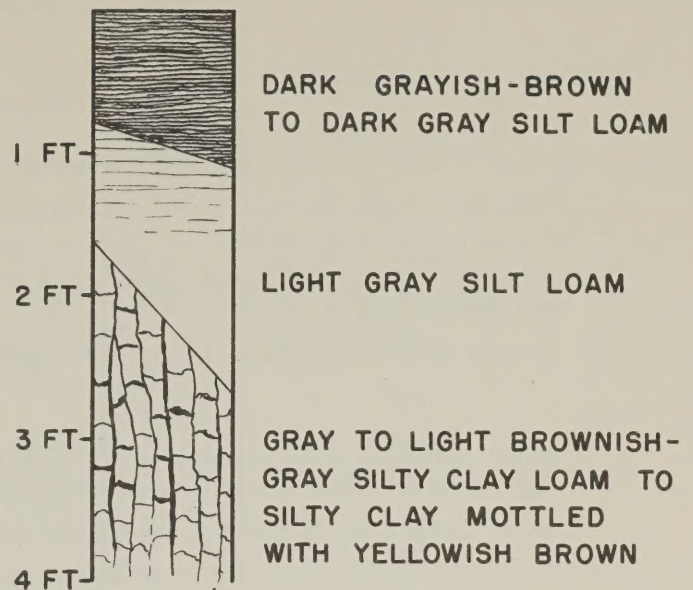




## USE AND MANAGEMENT OF SOIL TYPES:\*

### 2 - CISNE SILT LOAM 287 - CHAUNCEY SILT LOAM

Light-colored, poorly to very poorly drained, medium-textured soils developed from loess or colluvial sediments over leached glacial till. Cisne has a claypan subsoil beginning within depths of 18 to 24 inches below the top of the soil profile and occurs on nearly level, upland areas. Chauncey has a claypan subsoil beginning within depths of 24 to 32 inches below the top of the soil profile and occurs on nearly level areas near the head of drainageways or at the base of slopes where sediments have washed down (colluvial) from surrounding higher land.



### *Management Suggestions for Cropland*

Drainage, organic matter, and fertility are the major problems on these soils.

#### *Drainage*

Because of the tight subsoils, surface drainage is most practical for this land. These soils are very slowly permeable and since water does not soak in as fast as desirable, they are often wet late in the spring. Tile do not function satisfactorily in these soils.

#### *Fertility and maintenance of tilth*

These soils are acid and should be limed so that deep-rooting legumes may be grown. They are low to very low in available phosphorus and low to medium in available potassium. These nutrients should be added according to needs as indicated by soil tests.

Organic matter and nitrogen are low. These materials should be applied regularly to improve the physical condition of the surface soil and also crop yields. Good sources of organic matter and nitrogen are animal manure and legume and grass crops in the rotation. Nitrogen may also be added in the form of commercial fertilizer.

#### *Erosion control*

Erosion control is seldom needed on these soils since they occur on nearly level areas.

#### *Crop rotations*

With adequate surface drainage, these soils should be kept in grass and legumes 1 year out of 4. A rotation such as, corn, soybeans, wheat, and meadow is suitable. If only one row crop is grown, use a rotation which includes meadow 1 year out of 3.

\* These soil types are included in Land Capability Class

For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.



### ***Other Management Suggestions***

When this land is used for pasture, woodland, or wildlife, the following recommendations apply:

#### *Permanent pasture*

1. Test soils and apply lime and fertilizer according to recommendations.
2. Since these soils tend to stay wet late in the spring, they should not be pastured early unless a tough sod has been formed.
3. Allow pastures to make a good growth before grazing in spring and regulate grazing throughout season.
4. Clip for weed control and to promote uniform grazing.

#### *Woodland*

1. These soils are not particularly good for timber production; growth rates would probably not exceed 100 to 120 board feet per acre per year in good stands.
2. Where stands exist, favor black oak, red oak, and post oak, and protect from fire and grazing.
3. There is no information on the possibilities of conifers planted on these soils.

#### *Wildlife*

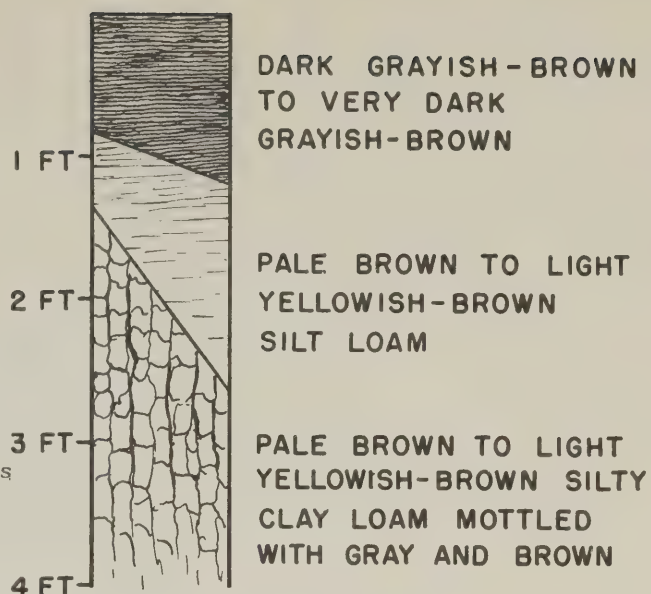
1. Plant or keep odd areas, pond areas, field borders, and permanent fences to adapted trees, shrubs, or grasses and legumes and protect from fire and grazing.
2. Protect ground-nesting birds. Don't mow field borders until after small grain harvest.
3. Stock ponds of proper size and depth with bass and bluegills for fish production.



## USE AND MANAGEMENT OF SOIL TYPES:

- 3 – HOYLETON SILT LOAM
- 4 – RICHVIEW SILT LOAM
- 167 – LUKIN SILT LOAM

Light-colored, imperfectly drained, medium-textured soils developed from loess or colluvial sediments over leached glacial till. Hoyleton and Richview have fine-textured (silty clay loam) subsoils beginning within depths of 14 to 24 inches below the top of the soil profile and occur on nearly level to gently sloping, upland areas. Lukin has a silty clay loam subsoil beginning within depths of 24 to 32 inches below the top of the soil profile and occurs on gentle slopes near drainageways or at the base of steeper slopes where sediments have washed down (colluvial) from surrounding higher land.



### *Management Suggestions for Cropland*

Drainage on nearly level areas, erosion control on sloping land, and soil fertility are the major problems on these soils.

#### *Drainage*

Where these soils occur on nearly level areas, surface drainage is usually required. Water normally moves through these soils slowly and, therefore, after rains they may stay wet longer than is desirable.

#### *Fertility and maintenance of tilth*

These soils are acid, usually low in available phosphorus, and low to medium in available potassium. Limestone and fertilizer should be applied according to soil test recommendations.

These soils are low to medium in organic matter and nitrogen, and therefore, grass and legumes should be grown at regular intervals to maintain a supply of fresh organic matter. Decaying organic matter not only supplies nitrogen for grain crops but also helps to maintain a loose, well-granulated structure necessary for good movement of air and water. It also helps to control erosion on sloping land. Another source of organic matter and nitrogen is animal manure. Nitrogen may also be applied by commercial fertilizer.

#### *Erosion control*

Where these soils occur on sloping areas, erosion is a major problem. Erosion can be controlled by using the conservation practices listed in the table below along with the recommended rotation. Note that with the more intensive conservation practices shorter rotations are necessary for erosion control.

#### *Crop rotations*

The following table lists the most intensive crop rotations to be used on different slopes and erosion or depth to subsoil with various practices.



**Most Intensive Crop Rotations Recommended for Soil Types 3, 4, and 167 Occurring on Different Slopes and  
With Varying Depths to Subsoil**

(See Part I for meaning of slope group and erosion or depth to subsoil symbols)

Slope group	Erosion or depth to subsoil	Land capability class <sup>1/</sup>	Crop rotations recommended for--			
			No practice	Contouring	Strip cropping	Terracing
A	0		R-R-G-M	Surface drainage may be needed		
B	0, 1		R-R-G-M-M	R-R-G-M	R-R-G-M-M-M	R-R-G-M
	2		R-G-M-M	R-R-G-M-M	R-R-G-M-M-M	R-R-G-M
C	1		G-M-M-M-M	R-G-M-M	R-R-G-M-M-M	R-R-G-M
	2		G-M-M-M-M	R-G-M-M	R-G-M-M	R-R-G-M
	3		G-M-M-M-M	G-M-M-M-M	G-M-M-M-M	G-M-M-M-M

<sup>1/</sup> For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

R = Row crop; G = Small grain; M = Rotational hay or pasture; for example, a R-G-M-M rotation includes 1 year of row crops, 1 year of small grain crops, and 2 years of rotation hay or pasture in a 4-year period.

### **Other Management Suggestions**

These soils are best suited for cultivated crops and hayland. However, some areas might be used for pasture, woodland, or wildlife. When they are used for these purposes, the following recommendations apply:

#### *Permanent pasture*

1. Apply limestone and fertilizer according to needs as indicated by soil tests.
2. Tear up old sod and reseed adapted legumes and grasses, such as Ladino clover, alfalfa, alsike clover, red clover, lespedeza, birdsfoot trefoil, tall fescue, brome grass, timothy, and redtop.
3. Control grazing to maintain legume and grass stands and clip to control weeds.

#### *Woodland*

1. Timber stands grow reasonably well on these soils; adequately-stocked, well-managed stands should grow 300 or more board feet per acre per year.
2. Manage existing stands to favor white oak, red oak, black oak, and yellow poplar, and protect from fire and grazing.
3. Harvest mature, defective, and less desirable trees unless they are needed to provide vegetative cover.
4. Plantations of shortleaf and loblolly pine grow very well on these soils, producing fence posts in 12 to 15 years and small saw logs in about 30 years.

#### *Wildlife*

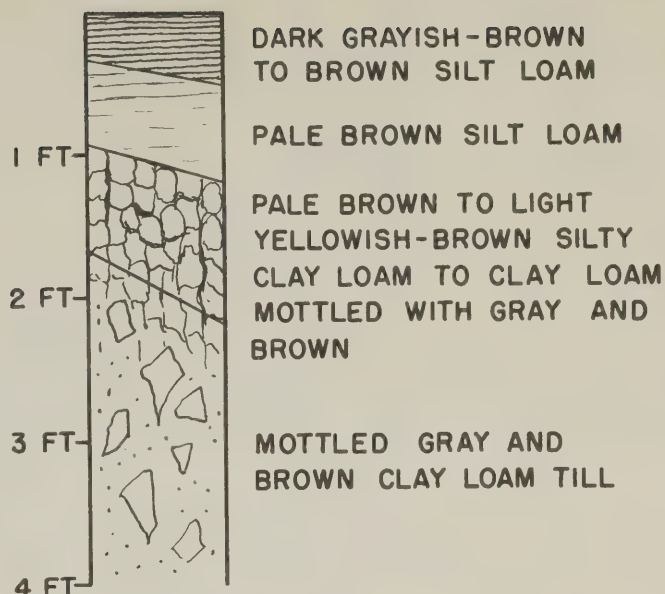
1. Plant or keep odd areas, pond areas, field borders, and permanent fences to adapted trees, shrubs, or grasses and legumes and protect from fire and grazing.
2. Protect ground-nesting birds. Don't mow field borders until after small grain harvest.
3. Stock ponds of proper size and depth with bass and bluegills for fish production.



## USE AND MANAGEMENT OF SOIL TYPE:

### 5 - BLAIR SILT LOAM

Light-colored, imperfectly drained, medium-textured soil formed from less than 24 inches of loess over leached glacial till. Blair occurs on moderately to strongly sloping, upland areas.



#### *Management Suggestions for Cropland*

Erosion control and maintenance of soil fertility are the major problems on this soil.

#### *Drainage*

Drainage is not a problem on Blair except in some small areas where seepage occurs.

#### *Fertility and maintenance of tilth*

This soil is acid, low in available phosphorus, and low to medium in available potassium. Soil tests should be made and fertilizer and lime applied according to recommendations. Blair responds fairly well to soil treatment.

Organic matter and nitrogen are low. Unless these materials are added regularly, crop yields will be low. Both organic matter and nitrogen may be provided by applying animal manure and by growing legumes and grasses. Nitrogen may also be added by use of commercial fertilizers.

The addition of organic matter also helps to keep the surface soil more porous to air and water.

#### *Erosion control*

Since erosion is a major problem on this soil, careful consideration should be given to crop rotations and erosion control practices. Listed in the table below are the possible combinations of rotations and conservation practices that may be used. Where Blair is severely eroded or where its slopes are 7 percent or more, the land should be used for pasture and hay production.

## Crop rotations

Most Intensive Crop Rotations Recommended for Soil Type 5 Occurring on Different Slopes and With Varying Depths to Subsoil

(See Part I for meaning of slope group and erosion or depth to subsoil symbols)

Slope group	Erosion or depth to subsoil	Land capability class <sup>1/</sup>	Crop rotations and land use recommended for--			
			No practice	Contouring	Strip cropping	Terracing
C	1		G-M-M-M-M	R-G-M-M	R-R-G-M-M-M	R-R-G-M
	2		G-M-M-M-M	R-G-M-M	R-G-M-M	R-R-G-M
	3		G-M-M-M-M	G-M-M-M-M	G-M-M-M-M	G-M-M-M-M
D	2		Pasture or	G-M-M-M-M	G-M-M-M-M	G-M-M-M-M
	3		woodland	Pasture or woodland		

<sup>1/</sup> For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

R =Row crop; G =Small grain; M =Rotation hay or pasture; for example, a R-G-M-M rotation includes 1 year of row crops, 1 year of small grain, and 2 years of rotation hay or pasture in a 4-year period.

## Other Management Suggestions

This soil may be used for cultivated crops only on slopes of less than 7 percent that are not severely eroded. On severely eroded slopes of less than 7 percent that have less than 3 inches of surface soil remaining and on all slopes greater than 7 percent, it should be used for hay, pasture or woodland.

For uses other than cropland the following recommendations should be followed:

### Permanent pasture

1. Apply limestone and fertilizer according to needs as indicated by soil tests.
2. Tear up old sod and reseed adapted legumes and grasses, such as Ladino clover, alfalfa, alsike clover, red clover, lespedeza, birdsfoot trefoil, tall fescue, brome grass, timothy, and redtop.
3. Control grazing to maintain legume and grass stand and clip to control weeds.

### Woodland

1. Timber stands grow reasonably well on this soil; adequately-stocked, well-managed stands should grow 300 board feet per acre per year.
2. Manage existing stands to favor white oak, red oak, black oak, and yellow poplar, and protect from fire and grazing.
3. Harvest mature, defective, and less desirable trees unless they are needed to provide vegetative cover.
4. Plantations of shortleaf and loblolly pine grow well on this soil, producing fence posts in 12 to 15 years and small saw logs in about 30 years.

### Wildlife

1. Plant or keep odd areas, pond areas, field borders and permanent fences to adapted trees, shrubs, or grasses and legumes and protect from fire and grazing.
2. Protect ground-nesting birds by not mowing field borders until after small grain harvest.
3. Stock ponds of proper size and depth with bass and bluegills for fish production.

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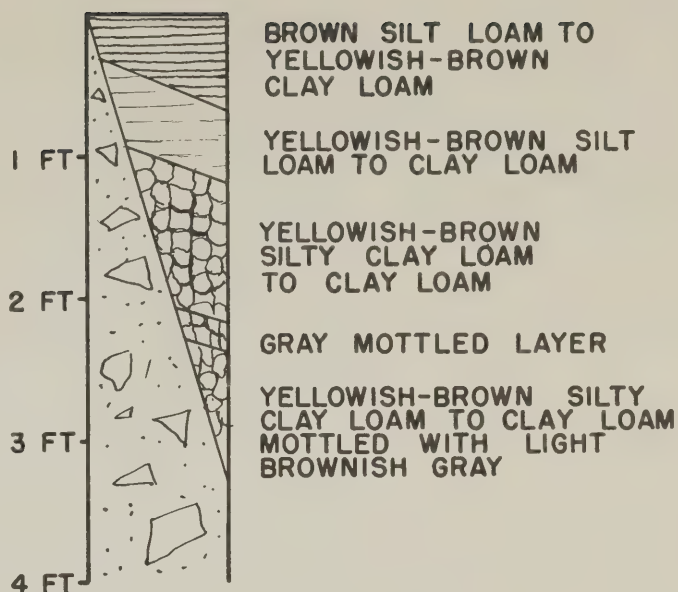
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## USE AND MANAGEMENT OF SOIL TYPES:

- 8 – HICKORY LOAM
- 8-14 – HICKORY LOAM – AVA SILT LOAM COMPLEX
- 8-214 – HICKORY LOAM – HOSMER SILT LOAM COMPLEX

Light-colored, moderately well-drained soils. Ava and Hosmer are medium-textured soils that have developed from loess. Where they occur in a soil complex with Hickory (8-14 or 8-214), they usually occupy the upper portion of slopes. Hickory loam is a moderately fine-textured soil developed from glacial till and in the soil complexes with Ava and Hosmer, it usually is found on the lower portion of the slopes. Ava and Hosmer have soil profiles of the nature indicated on the right side of the diagram at the right. Hickory is a deeply weathered soil having some sand and some rocks and lots of pebbles as indicated on the left side of the above diagram. These soils occur on strongly sloping to steep, upland areas.



### *Management Suggestions for Cropland*

Erosion and maintenance of soil fertility are the main problems on these soils. They are suited for only very limited cultivation.

#### *Drainage*

Ordinarily drainage is not a problem on these soils.

#### *Fertility and maintenance of tilth*

These soils are low in available phosphorus and medium to high in available potassium. They are acid. Soil tests should be made and fertilizer and lime applied according to recommendations.

Organic matter and nitrogen are low. These materials may be supplied by applying animal manure and growing legume-grass crops. Nitrogen may also be supplied by using commercial fertilizer.

Although the physical condition of this land has been greatly impaired by erosion, hay and pasture crops, with the addition of fertilizer and animal manure, will help to improve it.

#### *Erosion control*

Erosion is a major problem on these soils. Maintaining them in the correct land use is most important. As indicated in the table on most intensive rotations and land use, these soils should be used mainly for pasture or woodland. In this way further destruction of the soils by erosion can be prevented.

#### *Crop rotations*

Row crops should not be grown on this land more often than 1 year out of 5 or 6. When a row crop or small grain crop is used to reestablish the legumes and grasses, it should be confined to slopes of less than 12 percent and used with a supporting practice, such as contouring.

If terraces can be established (very seldom possible) on this land where it is not severely eroded and has less than a 12-percent slope, a rotation consisting of 1 row crop, 1 small grain crop, and 3 years of meadow may be used.

**Most Intensive Crop Rotations Recommended for Soil Types 8, 8-14, and 8-214 Occurring on Different Slopes  
and With Varying Depths to Subsoil**

(See Part I for meaning of slope group and erosion or depth to subsoil symbols)

Slope group	Erosion or depth to subsoil	Land capability class <sup>1/</sup>	Crop rotations and land use recommended for--			
			No practice	Contouring	Strip cropping	Terracing
D	2		Pasture or woodland	G-M-M-M-M	G-M-M-M-M	R-G-M-M-M
	3			Pasture or woodland		
	4					
E	2		Pasture or woodland			
	3					
	4					
F	2		Pasture or woodland			
	3					
G	2		Pasture or woodland			
	3					

<sup>1/</sup> For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

R = Row crop; G = Small grain; M = Rotational hay or pasture; for example, a R-G-M-M rotation includes 1 year of row crops, 1 year of small grain, and 2 years of rotation hay or pasture in a 4-year period.

### **Other Management Suggestions**

Because of the steep slopes on which these soils occur and the danger of erosion, they are best suited for hay, pasture, woodland, or wildlife.

When used for these purposes, the following recommendations should be followed:

#### *Permanent pasture*

1. Test soils and apply lime and fertilizer according to needs.
2. Tear up old sod by shallow plowing, field cultivating, or disking and reseed with adapted legumes and grasses.

If it is necessary to plow for a seedbed, plow in alternate strips on the contour leaving a sod between the plowed strips. In this way it will take at least 2 years to get all of a slope seeded.

3. Prevent overgrazing.
4. Clip for weed control and to promote uniform grazing.

#### *Woodland*

1. Growth rates of adequately-stocked, well-managed stands may vary from 150 board feet for Hickory alone to 300 board feet per acre per year on the Ava-Hickory or Hosmer-Hickory complexes.
2. In managing existing stands favor white oak, red oak, and black oak, and cut mature, defective, and less desirable trees such as hickory, elm, and maple.
3. Protect from fire and grazing to prevent damage to young trees and to encourage growth of new ones.
4. Shortleaf pine and loblolly pine, if properly managed, make successful growth on these soils.

#### *Wildlife*

1. Plant or keep odd areas, pond areas, field borders, and permanent fences to adapted trees, shrubs, legumes and grasses, and protect from fire and grazing.
2. Protect ground-nesting birds by not mowing field borders until after small grain harvest.
3. Stock ponds of proper size and depth with adapted fish.

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1955

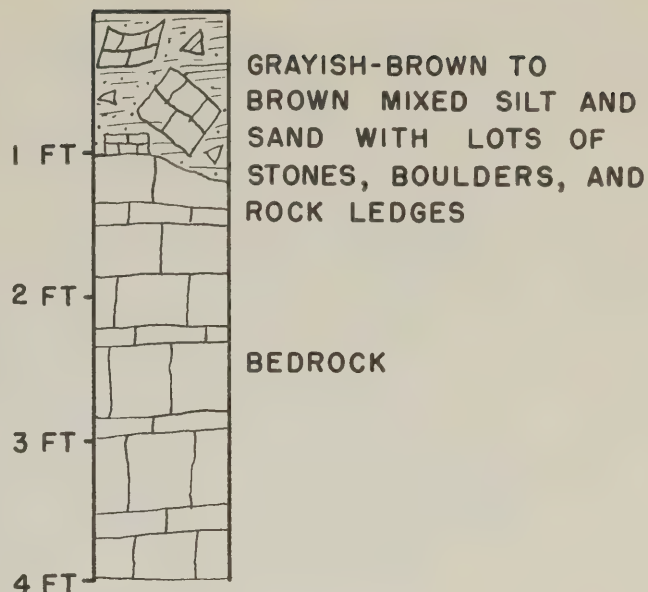


## USE AND MANAGEMENT OF LAND TYPES:\*

9 - STEEP ROCKY LAND, SANDSTONE MATERIAL

9V or 9 - STEEP ROCKY LAND, LIMESTONE MATERIAL

Generally less than 10 inches of mixed silty and sandy material and rocks and boulders on solid bedrock. Steep rocky land occurs on steep slopes and cliffs with rock outcrops common.



### Management Suggestions

The problems on this land are erosion, stoniness, and drouthiness. It is not suited for cultivated crops and should be used for woodland, wildlife, or limited pasture.

The total supply of mineral nutrients is very limited because of the very shallow depth of soil material on bedrock. The areas in which limestone predominates are less acid than those in which the bedrock is chiefly sandstone.

Keeping this land in trees is the best way to control erosion and make the most of its limited moisture and nutrient supply.

When used for permanent pasture, woodland, or wildlife the following recommendations apply:

#### *Permanent pasture*

1. Very few of these areas are suited for pasture. However, some sparsely wooded areas will afford limited pasture.
2. Areas which will permit seedbed preparation should have lime and fertilizer applied according to needs and be reseeded with adapted legumes and grasses.

\* Land type No. 9 is included in Land Capability Class

For an explanation of Land Capability classes, see your local Soil Conservation Service personnel.

### *Woodland*

1. Growth rate of timber is slow on this land type. Adequately-stocked stands growing on the less rocky areas may produce up to 150 board feet per acre per year. The average, however, is well below this.
2. In managing existing stands favor red cedar, black oak, southern red oak, and post oak. Cut mature, defective, and less desirable trees such as hickory and blackjack oak.
3. Protect from fire and grazing.
4. Watershed protection is one of the greatest contributions of maintaining the best possible forest cover on this land.

### *Wildlife*

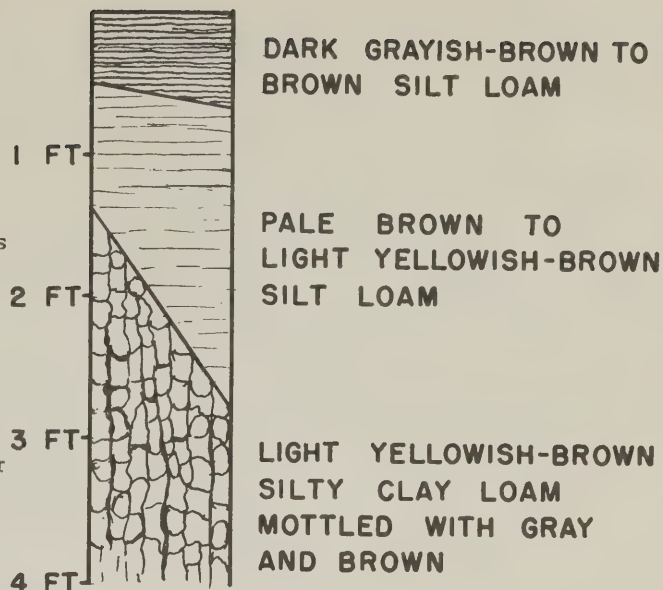
1. Plant adapted trees, shrubs, grasses, or legumes in odd areas and along the border of wooded areas.
2. Protect from fire and grazing.



## USE AND MANAGEMENT OF SOIL TYPES:

### 13 – BLUFORD SILT LOAM 337 – CREAL SILT LOAM

Light-colored, imperfectly drained, medium-textured soils formed from loess or colluvial sediments over leached glacial till. Bluford has a fine-textured (silty clay loam) subsoil beginning within depths of 16 to 24 inches below the top of the soil profile and occurs on nearly level to gently sloping, upland areas. Creal has a fine-textured (silty clay loam) subsoil beginning within depths of 24 to 32 inches below the top of the soil profile and occurs on gentle slopes near drainageways or at the base of steeper slopes where sediments have washed down (colluvial) from surrounding higher land.



### *Management Suggestions for Cropland*

Drainage on nearly level areas and erosion control on the gently sloping areas, plus soil fertility on all areas, are the major problems on these soils.

#### *Drainage*

Where these soils occur on nearly level areas, surface drainage is usually required. Water normally moves through these soils slowly and, therefore, the more level areas may stay wet for longer periods than is desirable unless an adequate system of surface drainage has been provided.

#### *Fertility and maintenance of tilth*

These soils are acid, low to very low in available phosphorus, and low to medium in available potassium. Soil tests should be made and fertilizer and lime applied according to recommendations. Bluford and Creal respond well to a good soil treatment program.

Organic matter and nitrogen are low. Unless these materials are added regularly, crop yields will be disappointingly low. Both organic matter and nitrogen may be provided by applying animal manure and by growing legumes and grasses. Nitrogen may also be added by use of commercial fertilizers.

The structure of the plow layer of these soils breaks down easily. This tendency of the surface soil to run together retards the intake and movement of air and water. Furthermore, since the subsoil is slowly permeable, underdrainage is slow. Favorable tilth of the surface soil may be maintained by adding organic matter regularly in the form of manure and legume-grass sod crops. Also, all crop residues should be returned to the soil.

#### *Erosion control*

Where these soils occur on gently sloping areas, erosion is a problem. Erosion can be controlled by using the conservation practices listed in the table below along with the recommended rotations. Note that with more intensive conservation practices, shorter rotations are necessary to control erosion.

## Crop rotations

### Most Intensive Crop Rotations Recommended for Soil Types 13 and 337 Occurring on Different Slopes and With Varying Depths to Subsoil

(See Part I for meaning of slope group and erosion or depth to subsoil symbols)

Slope group	Erosion or depth to subsoil	Land capability class <sup>1/</sup>	Crop rotations recommended for--			
			No practice	Contouring	Strip cropping	Terracing
A	0		R-R-G-M	Surface drainage may be needed		
B	0, 1		R-R-G-M-M	R-R-G-M	R-R-G-M-M-M	R-R-G-M
	2		R-G-M-M	R-R-G-M-M	R-R-G-M-M-M	R-R-G-M

<sup>1/</sup> For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

R = Row crop; G = Small grain; M = Rotation hay or pasture; for example, a R-G-M-M rotation includes 1 year of row crops, 1 year of small grain; and 2 years of rotation hay or pasture in a 4-year period.

### Other Management Suggestions

These soils are best suited for cultivated crops and probably will have a greater return when used as such. However, some areas may be used for pasture, woodland, or wildlife. For these purposes the following recommendations apply:

#### Permanent pasture

1. Apply limestone and fertilizer according to needs as indicated by soil tests.
2. Tear up old sod and reseed adapted legumes and grasses such as Ladino clover, alfalfa, alsike clover, red clover, lespedeza, birdsfoot trefoil, tall fescue, brome grass, timothy, and redtop.
3. Control grazing to maintain legume and grass stands and clip to control weeds.

#### Woodland

1. Timber stands grow reasonably well on these soils; adequately-stocked, well-managed stands should grow 300 or more board feet per acre per year.
2. Manage existing stands to favor white oak, red oak, black oak, and yellow poplar, and protect from fire and grazing.
3. Harvest mature, defective, and less desirable trees unless they are needed to provide vegetative cover.
4. Plantations of shortleaf and loblolly pine grow very well on these soils, producing fence posts in 12 to 15 years and small saw logs in about 30 years.

#### Wildlife

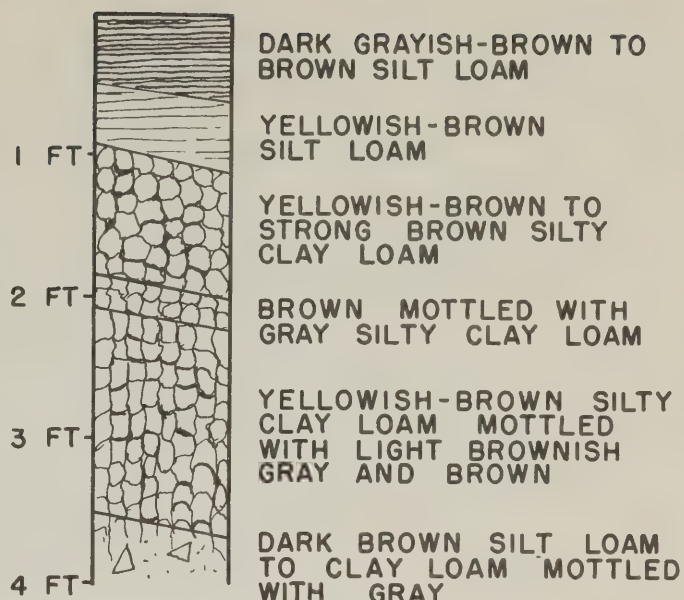
1. Plant or keep odd areas, pond areas, field borders and permanent fences to adapted trees, shrubs, or grasses and protect from fire and grazing.
2. Protect ground-nesting birds. Don't mow field borders until after small grain harvest time.
3. Stock ponds of proper size and depth with bass and bluegills for fish production.



## USE AND MANAGEMENT OF SOIL TYPE:

### 14 - AVA SILT LOAM

Light-colored, moderately well-drained, medium-textured soil developed from loess over leached glacial till. Ava occurs on gently sloping to steep, upland areas.



### *Management Suggestions for Cropland*

Erosion control and maintenance of fertility are the major problems on this soil.

#### *Drainage*

Drainage is not a problem on this soil, except in some small areas where seepage occurs.

#### *Fertility and maintenance of tilth*

This soil is acid, low in available phosphorus, and low to medium in available potassium. Soil tests should be made to determine the amounts of limestone and fertilizer to be applied.

Organic matter and nitrogen are usually low. In order to maintain high yields of crops, it is necessary to regularly replenish these materials in the soil. The best sources for organic matter and nitrogen are animal manure and legumes and grasses. Nitrogen may also be applied in commercial fertilizer.

Good physical condition of the surface soil is helpful in increasing water intake and thus reducing runoff. It also helps provide more favorable moisture and air conditions in the soil for plant growth. The best way to maintain good physical condition is to follow the rotations and practices shown in the table below.

#### *Erosion control*

Erosion control is a major problem on the more sloping areas of this soil. Contour farming and grass waterways are very helpful in reducing erosion. Leaving crop residues on the surface during fall, winter, and spring will help greatly to slow down runoff. Terraces are very effective in reducing runoff and erosion where they are adapted. In order to control erosion on slopes greater than 7 percent, it is necessary to use this land for hay or pasture.

## Crop rotations

### Most Intensive Rotations Recommended for Soil Type 14 Occurring on Different Slopes and With Varying Depths to Subsoil

(See Part I for slope group and erosion or depth to subsoil symbols)

Slope group	Erosion or depth to subsoil	Land capability class <sup>1/</sup>	Crop rotations and land use recommended for--			
			No practice	Contouring	Strip cropping	Terracing
B	1		R-R-G-M	R-R-G-M	R-R-G-M-M-M	R-R-G-M
	2		R-R-G-M-M	R-R-G-M	R-R-G-M-M-M	R-R-G-M
C	1		R-G-M-M	R-R-G-M-M	R-R-G-M-M-M	R-R-G-M
	2		R-G-M-M	R-R-G-M-M	R-R-G-M-M-M	R-R-G-M
	3		G-M-M-M-M	G-M-M-M-M	G-M-M-M-M	G-M-M-M-M
D	1, 2		Pasture or woodland	G-M-M-M-M	G-M-M-M-M	G-M-M-M-M
	3			Pasture, or woodland		
E	1, 2		Pasture or woodland			
	3					

<sup>1/</sup> For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

R = Row crop; G = Small grain; M = Rotational hay or pasture; for example, a R-G-M-M rotation includes 1 year of row crops, 1 year of small grain crops, and 2 years of rotation hay or pasture in a 4-year period.

### Other Management Suggestions

Some areas of Ava are better adapted for pasture, woodland, or wildlife, than for cropland. The following recommendations apply to areas best suited for these purposes:

#### Permanent pasture

1. Apply limestone and fertilizer according to needs as indicated by soil test.
2. Tear up old sod and reseed adapted legumes and grasses, such as Ladino clover, alfalfa, alsike clover, red clover, lespedeza, birdsfoot trefoil, tall fescue, brome grass, timothy, and redtop.
3. Control grazing to maintain legume and grass stand and clip to control weeds.

#### Woodland

1. This soil is very productive for forest. Adequately-stocked stands of desirable species such as white oak, red oak, and black oak will grow up to 500 board feet per acre per year when properly managed.
2. Harvest mature, defective, and less desirable trees such as hickory, maple, and elm unless they are needed to provide vegetative cover.
3. Protect from fire and grazing.
4. Plantations of shortleaf pine and loblolly pine, if properly managed, will produce fence post material in 12 to 15 years and small saw logs in about 30 years.
5. Scotch pine and red pine may be planted for Christmas trees.

#### Wildlife

1. Plant or keep odd areas, pond areas, field borders, and permanent fences to adapted trees, shrubs, or grasses and legumes and protect from fire and grazing.
2. Protect ground-nesting birds by not mowing field borders until after small grain harvest.
3. Stock ponds of proper size and depth with bass and bluegills for fish production.

Department of Agronomy, University of Illinois Agricultural Experiment Station  
in cooperation with

Soil Conservation Service, United States Department of Agriculture

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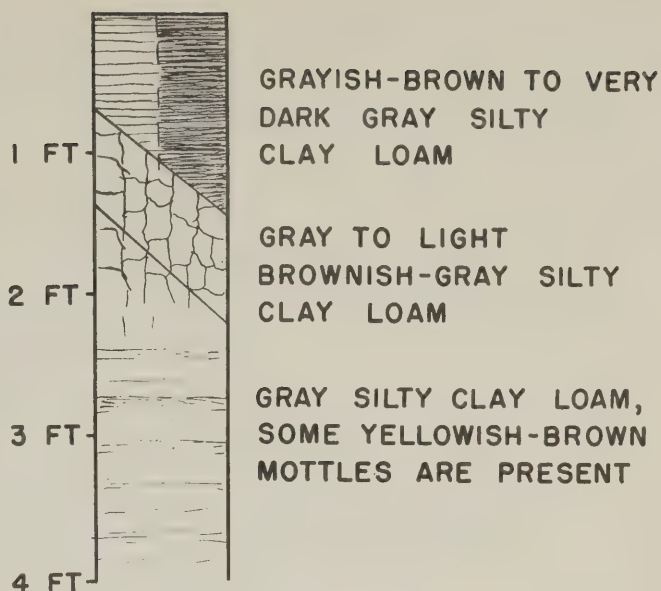


## USE AND MANAGEMENT OF SOIL TYPES:\*

70 – BEAUCOUP SILTY CLAY LOAM

288 – PETROLIA SILTY CLAY LOAM

Light- to moderately dark-colored, poorly to very poorly drained, fine-textured bottomland soils. Beaucoup and Petrolia are similar in many respects. The chief difference is that Beaucoup has a thicker and darker-colored surface soil as indicated on the right half of the profile diagram to the right. Petrolia usually has less than 8 inches of slightly darkened surface soil as indicated on the left side of the profile diagram.



### *Management Suggestions for Cropland*

The major problems on these soils are drainage and overflow hazard, maintenance of good physical condition, and fertility.

#### *Drainage*

Overflow is often a serious problem on these soils.

Drainage is also a serious problem in that a high water table usually exists, causing the surface soil to remain wet and waterlogged for long periods of time. Surface ditches are very effective in carrying off excess water. If proper outlets can be obtained, tile will function slowly. However, where surface ditches can be used to provide adequate drainage, tiling is not usually recommended.

#### *Fertility and maintenance of tilth*

These soils are low in available phosphorus and low to medium in available potassium. Limestone is usually not needed in large amounts. However, soil tests should be made and lime and fertilizer applied according to recommendations. Usually these soils are moderately productive.

Organic matter and nitrogen are low to medium in these soils. For high crop yields these materials should be added regularly. Leguminous organic matter, animal manure, commercial fertilizer, or some combinations of these sources may be used.

Because of the heavy texture or high amount of clay in these soils, they should never be plowed when too wet. Additions of organic matter through the growth of grasses and legumes or animal manure will greatly improve the tilth of these soils making them easier to work.

#### *Erosion control*

Erosion is not a problem on these soils.

#### *Crop rotations*

Where this land is sufficiently drained for crop rotations, it should be in grass and legumes at least 1 year out of 4. This could be a rotation consisting of 1 year of corn, 1 year of soybeans, 1 year of small grain, and 1 year of grass and legumes.

\* These soil types are included in Land Capability Class

For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

Where this land is not sufficiently drained or protected from overflow to permit the growing of small grain crops or standover legumes, a catch crop should be used. This could be a rotation in which sweet clover is seeded at the last cultivation of corn. All crop residues should be returned to the soil and commercial nitrogen should be used if more of this element is needed than the legumes supply.

### ***Other Management Suggestions***

This is good cropland if properly drained and the overflow hazard is not too serious. However, these soils are sometimes too wet for cultivation and are used for pasture, woodland, or wildlife. When used for these purposes, the following recommendations apply:

#### ***Permanent pasture***

1. Test the soil, apply fertilizer and lime as recommended, and seed adapted grasses and legumes, such as tall fescue, reedtop, Ladino clover, and alsike clover.
2. When the overflow hazard is very serious or the soils are very wet, reed canary grass may be used for forage.

#### ***Woodland***

1. These soils are fair for timber production; well-stocked stands should produce from 400 to 500 board feet per acre per year.
2. In the management of existing stands, favor oak (wet site species), sweet gum, sycamore, cottonwood, and soft maple.
3. Harvest mature, defective, and less desirable trees such as willow and honey locust.
4. Protect from fire and grazing.

#### ***Wildlife***

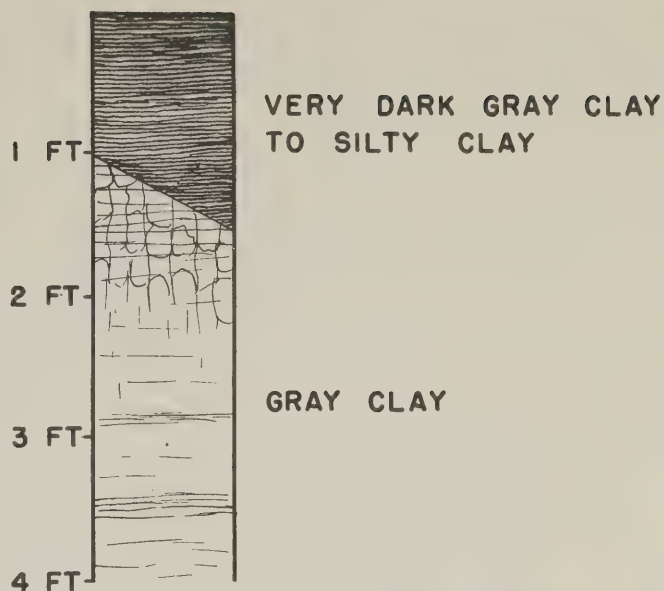
1. Plant or keep odd areas, field borders, and ditch banks to adapted trees, shrubs, grasses, and legumes, and protect from fire and grazing.
2. Delay mowing field borders and odd areas until after time for small grain harvest to protect ground-nesting birds.



## USE AND MANAGEMENT OF SOIL TYPE:\*

### 71 - DARWIN CLAY

Moderately dark-colored, very poorly drained, very fine-textured bottomland soil occurring in low-lying or depressional areas.



#### *Management Suggestions for Cropland*

The major problems on Darwin are drainage, maintenance of soil tilth, and fertility.

#### *Drainage*

Because of its low-lying position, suitable outlets for drainage are often a problem. Darwin has a high clay content and water passes through it very slowly. Therefore, tile drainage is impractical. Surface ditches have been found to be the best system of drainage for Darwin. In many places diversion ditches can be used to advantage to divert water from nearby hills.

#### *Fertility and maintenance of tilth*

Darwin is usually slightly acid to neutral and very seldom is limestone needed. However, some places might be acid enough to need some lime. It is medium in available phosphorus and usually high in available potassium. Soil tests should be made to determine the amounts of each of these elements needed.

Organic-matter content is medium to high. However, grass and leguminous crops should be grown to furnish fresh organic matter and nitrogen and to keep the surface open and porous.

#### *Erosion control*

Erosion is not a problem on this soil.

#### *Crop rotations*

Crop rotations are often difficult to maintain because of wet conditions and overflow. However, if adequate drainage can be obtained, a rotation consisting of adapted grasses and legumes at least 1 year in 3 may be used. Grasses and legumes tolerant to wet soil conditions, such as reed canary grass, tall fescue, redtop, alsike clover, and Ladino clover should be used.

On areas where small grain or legumes will not survive, a catch crop seeded at the last cultivation of corn should be used to help maintain organic matter and tilth. Commercial nitrogen should be used if necessary.

\* This soil type is included in Land Capability Class

For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

### ***Other Management Suggestions***

Darwin is often used for permanent pasture, woodland, or wildlife. When it is used for these purposes, the following suggestions apply:

#### *Permanent pasture*

1. Use legumes and grasses adapted to wet conditions.
2. Apply lime and fertilizer as needed.
3. Control grazing to maintain vigorous growth.
4. Clip to control weeds and to encourage uniform grazing.

#### *Woodland*

1. Manage existing stands carefully to encourage growth of valuable species such as cypress, sweet gum, ash, and soft maple.
2. Harvest mature, defective, and less desirable species such as willow and honey locust.
3. Protect from fire and grazing to prevent damage to growing trees and to encourage growth of new ones.

#### *Wildlife*

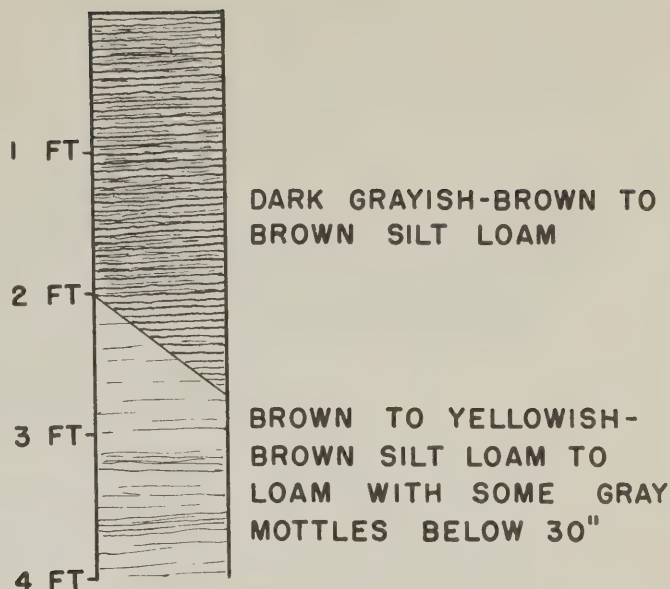
1. Plant adapted trees, grasses, and legumes in odd areas and on ditch banks.
2. Protect from fire and grazing.



## USE AND MANAGEMENT OF SOIL TYPE:\*

### 72 - SHARON SILT LOAM

Light-colored, moderately well to well-drained, medium-textured bottomland soil.



#### *Management Suggestions for Cropland*

The major problems on Sharon are fertility and overflow hazard.

#### *Drainage*

Drainage is not a serious problem on this soil. However, surface ditches may be helpful to drain low-lying areas. Where overflow is a serious problem, diversion ditches are helpful to intercept water from nearby hills.

#### *Fertility and maintenance of tilth*

This soil is acid and low in available phosphorus and available potassium. Soil tests should be made and lime and fertilizer applied according to recommendations based on these tests. Sharon is naturally moderately well to well-drained and responds well to soil treatment.

Organic matter and nitrogen are low to medium. For high crop yields, nitrogen must be applied regularly. Good sources of organic matter and nitrogen are grass and leguminous crops (when overflow hazard is not too frequent) and animal manure. Nitrogen may also be added by commercial fertilizer.

When the overflow hazard is too frequent for small grain crops or standover legume crops, a catch crop seeded during the last cultivation of corn might help to maintain organic matter and good physical condition.

#### *Erosion control*

Erosion is not a problem on this soil, although stream-bank cutting is sometimes serious.

#### *Crop rotations*

Use a rotation including 1 year of grass and legumes in 4 years, such as corn, soybeans, wheat, and grass and legumes, or include a catch crop every third or fourth year when manure or nitrogen is applied.

Crop residues should be returned to the soil.

\* This soil type is included in Land Capability Class

For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

### ***Other Management Suggestions***

This is good cropland, but it is sometimes used as pasture, woodland, or wildlife. When used for these purposes, the following recommendations apply:

#### *Permanent pasture*

1. Test soils, apply fertilizer and lime as recommended, and seed adapted grasses and legumes, such as tall fescue, redtop, Ladino clover, and alsike clover.
2. On areas that are wet or have a very serious overflow hazard, reed canary grass is a well-adapted pasture crop.

#### *Woodland*

1. This soil produces very good timber growth; well-stocked stands should grow from 700 to 800 board feet per acre per year.
2. In the management of existing stands, favor cottonwood, sweet gum, soft maple, ash, and cherry bark oak.
3. Cut mature, defective, or less desirable trees such as willow, pin oak, honey locust, box elder, and hickory.
4. Protect from fire and grazing to prevent damage to young trees and encourage growth of new ones.

#### *Wildlife*

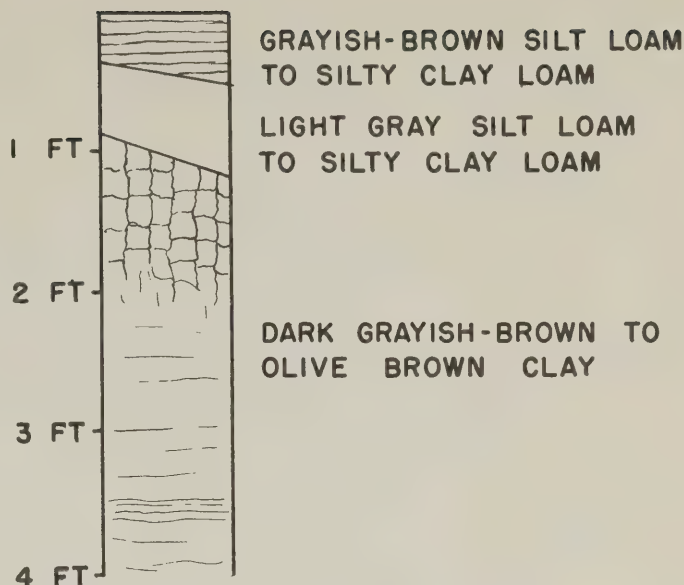
1. Practices for wildlife should include seeding adapted legumes and grasses on ditch banks, in odd areas, and along field borders.
2. Protect wildlife areas from fire and grazing.



## USE AND MANAGEMENT OF SOIL TYPE:\*

### 84 - OKAW SILT LOAM

Light-colored, poorly to very poorly drained, medium- to fine-textured soil developed from less than 14 inches of silty material on clay. Okaw occurs on nearly level to gently sloping, low-lying, terrace areas in northwestern Williamson county.



### *Management Suggestions for Cropland*

Maintenance of organic matter and tilth, drainage on level areas, and erosion on sloping areas are major problems on this soil. Okaw is naturally low in productivity.

#### *Drainage*

Since the subsoil is very fine-textured, plastic, and sticky when wet, and less than 14 inches below the top of the soil profile, water and air movement is greatly restricted. This soil is wet and waterlogged for long periods during the winter and spring. During dry weather it is a drouthy soil because of shallow rooting of crops and low available moisture. Drainage by surface ditches is recommended on Okaw.

#### *Fertility and maintenance of tilth*

Okaw is acid, low in available phosphorus, and low to medium in available potassium. Organic matter and nitrogen are very low.

Economic returns from soil treatment are apt to be low on this soil. Soil treatment should be used on a trial basis after soil tests have been made.

In order to keep the physical condition of the surface soil as open and porous to air and water as possible, Okaw should be kept in sod crops most of the time. Also livestock and machinery should be kept off this land when the soil is wet.

#### *Erosion control*

Sloping areas should be kept in pasture to control erosion.

#### *Crop rotations*

Even on level areas, it is seldom profitable to plant row crops on Okaw. Small grain will probably return a greater profit than other crops. Okaw needs to be kept in legumes and grass for 2 or 3 successive years between each grain crop.

\* This soil type is included in Land Capability Class

For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

### ***Other Management Suggestions***

When this land is used for pasture, woodland, or wildlife, the following recommendations are suggested:

#### ***Permanent pasture***

1. Plant adapted grasses and legumes. Yields may not warrant heavy soil treatment.
2. Regulate grazing. Clip for weed control and to promote uniform grazing.

#### ***Woodland***

1. This soil will support fair stands of pin oak and gum. Pin oak will make good growth if thinned properly, and can be marketed for piling, mine props, and posts or ties (if treated).
2. Protect timber stands from fire and grazing.

#### ***Wildlife***

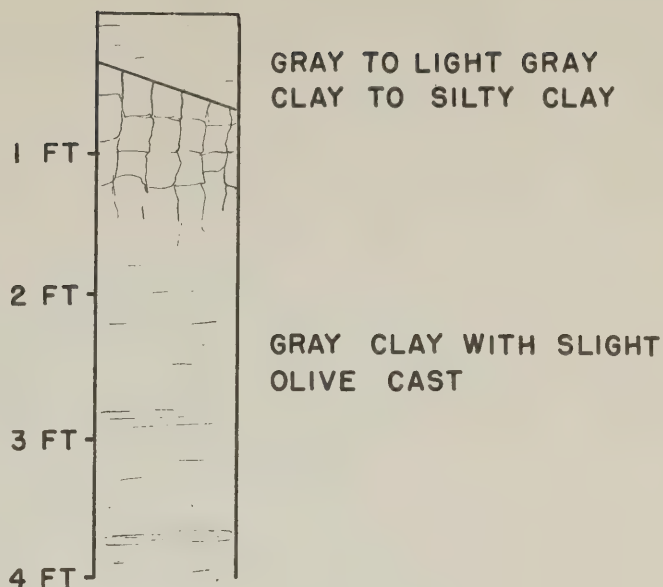
1. Plant wildlife borders to adapted trees, shrubs, or grasses and legumes for food and cover.
2. Prevent fire and keep livestock fenced out.



## USE AND MANAGEMENT OF SOIL TYPE: \*

### 85 - JACOB CLAY

Light-colored, very poorly drained, very fine-textured bottomland soil occurring on flat, low-lying, or depressional areas.



### *Management Suggestions*

Jacob clay is of little agricultural value because of its very fine texture, low organic-matter content, and very difficult drainage problems. Tile will not function in this soil and surface ditch drainage systems are often difficult to install because numerous ditches are required and suitable outlets are difficult to provide.

Jacob is acid, low in available phosphorus, and about medium in available potassium. Because of the difficult problems mentioned above, soil treatment is seldom worth-while.

Many areas of Jacob are in trees and these areas should be left and managed for timber and wildlife. This soil frequently supports pure stands of pin oak. If managed properly, such stands grow rapidly and will produce pilings, mine props, and posts or ties (if treated). Timber stands should be protected from fire and grazing.

Cleared areas may provide limited pasture but soil treatment and pasture establishment or pasture renovation should be on a trial basis before much money is invested.

\* This soil type is included in Land Capability Class

For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

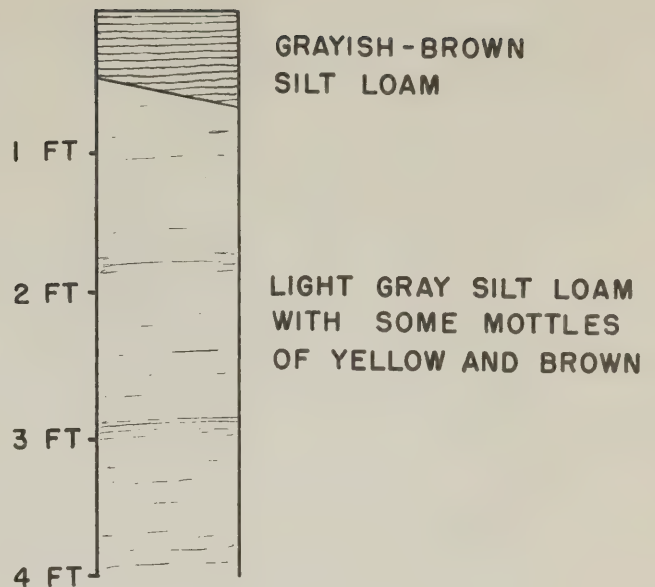




## USE AND MANAGEMENT OF SOIL TYPE:\*

### 108 – BONNIE SILT LOAM

Light-colored, poorly to very poorly drained, medium-textured bottomland soil.



#### *Management Suggestions for Cropland*

The main problems on Bonnie are drainage and overflow hazard, fertility, and maintenance of good tilth.

##### *Drainage*

Overflow is often a serious problem on Bonnie. Diversion ditches are sometimes helpful to intercept water from nearby hills.

Drainage is a serious problem in that a high water table often exists causing the surface soil to remain wet and waterlogged for long periods of time. Surface ditches are usually recommended to carry off excess water. It is questionable as to whether tile would function properly in this soil.

##### *Fertility and maintenance of tilth*

This soil is acid, low in available phosphorus, and very low in available potassium. Soil tests should be made and lime and fertilizer applied according to recommendations. When adequately drained, lime and fertilizer will increase crop yields.

Bonnie is very low in organic matter and nitrogen, and unless these materials are added regularly, crop yields will be low. Both organic matter and nitrogen may be provided by applying manure or by growing legumes and grasses and turning them under. Nitrogen may also be added in commercial fertilizers.

Every effort should be made to avoid cultivating or plowing this soil when it is too wet.

##### *Erosion control*

Erosion is not a problem on this land.

##### *Crop rotations*

Bonnie that is not too wet should have a green-manure crop 1 year out of 3. All crop residues should be returned to the soil.

When the land is too wet to grow small grain or when legumes will not survive the wet seasons, a catch crop should be used. This might be sweet clover or other adapted legumes seeded in corn at the last cultivation.

\* This soil type is included in Land Capability Class

For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

## ***Other Management Suggestions***

Some areas are quite often used for pasture, woodland, or wildlife. When used for these purposes, the following recommendations are suggested:

### *Permanent pasture*

1. Choose grasses and legumes adapted to wet soil conditions, such as reed canary grass, tall fescue, reedtop, timothy, alsike clover, and Ladino clover.
2. Apply lime and fertilizer according to soil tests.
3. Control grazing to maintain vigorous growth.
4. Clip to encourage uniform grazing and to control weeds.

### *Woodland*

1. This soil is fair for timber production; well-stocked stands should produce from 400 to 500 board feet per acre per year.
2. In the management of existing stands, favor oak (wet site species), sweet gum, sycamore, cottonwood, and soft maple.
3. Harvest mature, defective, and less desirable trees such as willow and honey locust.
4. Protect from fire and grazing.

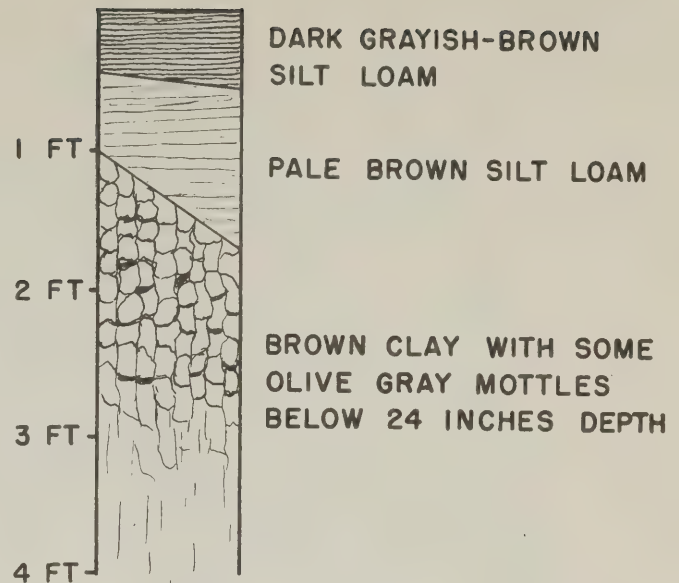
### *Wildlife*

1. Seed drainage ditch banks to grasses and legumes and delay mowing until after grain harvest to provide cover for ground-nesting birds.
2. Plant adapted shrubs, grasses, and legumes in odd areas.
3. Protect from fire and grazing.

## USE AND MANAGEMENT OF SOIL TYPE:

### 122 - COLP SILT LOAM

Light-colored, moderately well to imperfectly drained, medium-textured soil developed from thin (less than 24 inches) loess on water-deposited clay. Colp occurs on gently sloping to very steep, terrace areas in northwestern Williamson county.



### *Management Suggestions for Cropland*

Erosion, soil fertility, and organic matter are major problems on this soil. Only the gently sloping areas are suitable for cultivation.

#### *Drainage*

Drainage is not a serious problem on this soil ordinarily. Occasionally, however, a few well-placed ditches may be needed on the least sloping areas to improve drainage.

#### *Fertility and maintenance of tilth*

Colp is acid and low in available phosphorus so that limestone and phosphate are usually needed. It is high in available potassium so that additions of potash are seldom necessary. However, soil tests should be made and soil amendments applied according to recommendations based on these tests.

Organic matter and nitrogen are low. These should be added to the soil regularly by applying animal manure or growing grasses and legumes. Nitrogen may also be added in commercial fertilizer.

The subsoil of Colp has rather poor physical condition in that it is fine-textured and water and air do not pass through as fast as is desirable. In order to maintain good physical condition of the surface soil, organic matter should be applied regularly.

#### *Erosion control*

Erosion is a major problem on this land. In order to control erosion, the recommendations of crop rotations and land use in the table below should be followed as closely as possible. On those areas to be cultivated the conservation practices which are given for the rotations desired should be applied.

#### *Crop rotations*

Cultivated crops should be held to the more gentle slopes because of the danger of erosion.



### ***Other Management Suggestions***

This land is good cropland. However, some areas may be used for pasture, woodland, or wildlife. If used for these purposes, the following recommendations apply:

#### ***Permanent pasture***

1. Apply lime and fertilizer according to needs as indicated by soil tests.
2. Tear up old sod and reseed adapted legumes and grasses, such as Ladino clover, alfalfa, birdsfoot trefoil, lespedeza, tall fescue, brome grass, timothy, redtop, and orchard grass.
3. Control grazing to maintain legume stands and clip to control weeds.

#### ***Woodland***

1. Timber stands grow reasonably well on this soil; adequately-stocked, well-managed stands should grow 300 or more board feet per acre per year.
2. Manage existing stands to favor white oak, red oak, black oak, and yellow poplar, and protect from fire and grazing.
3. Harvest mature, defective, and less desirable trees unless they are needed to provide vegetative cover.
4. Plantations of shortleaf and loblolly pine grow very well on this soil, producing fence posts in 12 to 15 years and small saw logs in about 30 years.

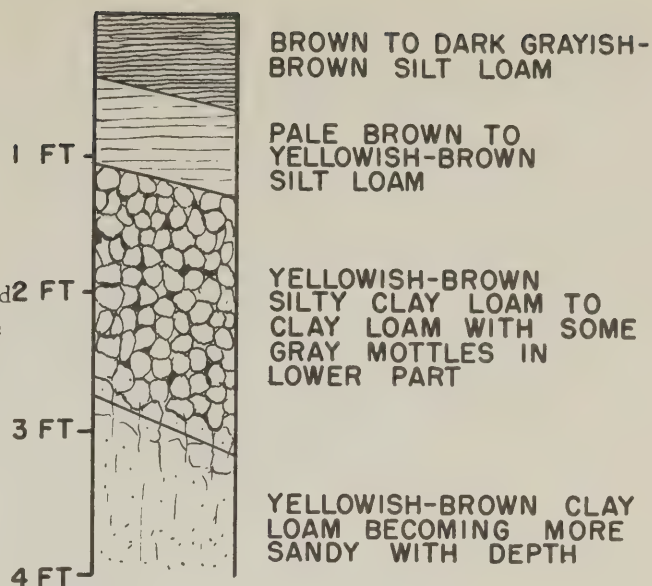
#### ***Wildlife***

1. Plant or keep odd areas, field borders, and permanent fences to adapted trees, shrubs, or grasses and legumes.
2. Protect ground-nesting birds. Don't mow field borders until after small grain harvest time.
3. Protect all wildlife areas from fire and grazing.

## USE AND MANAGEMENT OF SOIL TYPE:

### 134 - CAMDEN SILT LOAM

Light-colored, well- to moderately well-drained, medium-textured soil developed from thin loess on mixed water-deposited sand, silt, and clay. Camden occurs on nearly level to steep, terrace areas in northwestern Williamson county.



### *Management Suggestions for Cropland*

Erosion control and maintenance of soil fertility are the major problems.

#### *Drainage*

Drainage is not a problem on this soil.

#### *Fertility and maintenance of tilth*

Camden is acid, low to medium in available phosphorus, and usually high in available potassium. Soil tests should be made because the need for these elements may vary from place to place. Lime and fertilizers should be applied according to recommendations based on the soil tests.

Organic matter is low in this soil. Therefore, it is necessary to add animal manure, grow grasses and legumes, and return all crop residues to the soil. Nitrogen should be added regularly by both legumes and commercial fertilizer.

Camden is well drained and air and water usually move through it at desirable rates. However, with hard farming the structure of the surface soil tends to break down and thus restrict the intake and movement of air and water to some extent. This condition can be overcome by growing grass and legumes at periodic intervals in the rotation or by maintaining good sod stands and cover in areas used for pasture.

#### *Erosion control*

On sloping areas of Camden, erosion is a serious problem and good management is required if it is to be kept under control. The rotations and land use listed in the table below are designed to keep soil loss at a minimum.

## Crop rotations

Most Intensive Rotations Recommended for Soil Type 134 Occurring on Different Slopes and With Varying Depths to Subsoil

(See Part I for slope group and erosion or depth to subsoil symbols)

Slope group	Erosion or depth to subsoil	Land capability class <sup>1/</sup>	Crop rotations and land use recommended for--			
			No practice	Contouring	Strip cropping	Terracing
A	0		R-R-G-M			
B	0, 1		R-R-G-M	R-R-G-M	R-R-G-M-M-M	R-R-G-M
C	1		R-G-M-M	R-R-G-M-M	R-R-G-M-M-M	R-R-G-M
	2		R-G-M-M	R-R-G-M-M	R-R-G-M-M-M	R-R-G-M
	3		R-G-M-M	R-R-G-M-M	R-R-G-M-M-M	R-R-G-M-M
D	2		G-M-M-M-M	R-G-M-M	R-R-G-M-M-M	R-R-G-M-M
	3		G-M-M-M-M	G-M-M-M-M	G-M-M-M-M	G-M-M-M-M
E	2		Pasture or woodland		G-M-M-M-M	G-M-M-M-M

<sup>1/</sup> For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

R = Row crop; G = Small grain; M = Rotation hay or pasture; for example, a R-G-M-M rotation includes 1 year of row crops, 1 year of small grain crops, and 2 years of rotation hay or pasture in a 4-year period.

## Other Management Suggestions

The following suggestions apply to those areas to be used for permanent pasture, woodland, or wildlife:

### Permanent pasture

1. Apply limestone and fertilizer according to needs as indicated by soil tests.
2. Reseed with adapted legumes and grasses, such as alfalfa, Ladino clover, alsike clover, red clover, lespedeza, brome grass, tall fescue, orchard grass, timothy, and redtop.
3. On steep, severely eroded slopes, disk for seedbed, if possible, instead of plowing.
4. Control grazing to maintain legume stand and clip to control weeds.

### Woodland

1. This soil is very productive for forest. Adequately-stocked stands of desirable species such as white oak, red oak, and black oak will grow up to 500 board feet per acre per year when properly managed.
2. Harvest mature, defective, and less desirable trees such as hickory, maple, and elm unless they are needed to provide vegetative cover.
3. Protect from fire and grazing.
4. Plantations of shortleaf pine and loblolly pine, if properly managed, will produce fence post material in 12 to 15 years and small saw logs in about 30 years.
5. Scotch pine and red pine may be planted for Christmas trees.

### Wildlife

1. Plant or keep odd areas, pond areas, field borders, and permanent fences to adapted trees, shrubs, or grasses and legumes and protect from fire and grazing.
2. Protect ground-nesting birds by not mowing field borders until after small grain harvest time.
3. Stock suitable ponds with fish.

Department of Agronomy, University of Illinois Agricultural Experiment Station  
in cooperation with

Soil Conservation Service, United States Department of Agriculture

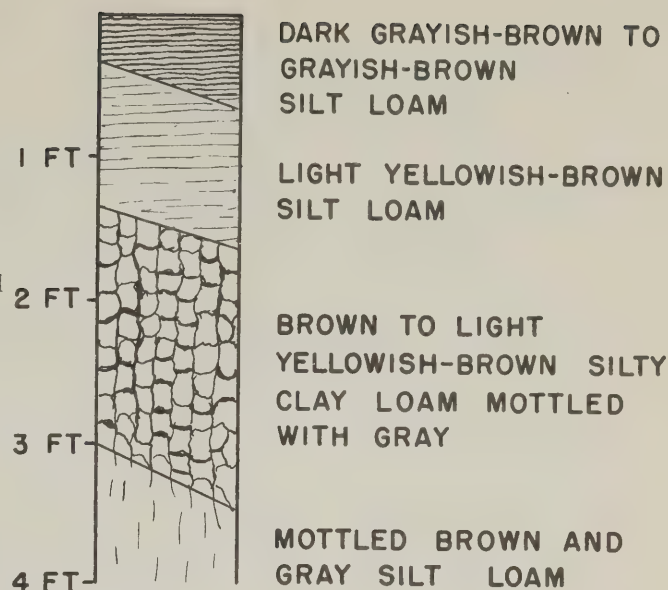
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## USE AND MANAGEMENT OF SOIL TYPE:

### 164 – STOY SILT LOAM

Light-colored, imperfectly drained, medium-textured soil developed from loess over leached glacial till or over bedrock. Stoy occurs on nearly level to gently sloping, upland areas.



#### *Management Suggestions for Cropland*

Maintenance of fertility and tilth are generally problems on this soil. Also, on the flatter areas drainage is required and on the more sloping areas erosion control is needed.

#### *Drainage*

Drainage is required on the nearly level areas of Stoy. Surface ditches are recommended for drainage on this soil since water moves through the subsoil too slow for tile to function satisfactorily.

#### *Fertility and maintenance of tilth*

This soil is usually acid and low in available phosphorus and low to medium in available potassium. Soil tests should be made and fertilizer applied as recommended.

Since organic matter and nitrogen are naturally low, every effort should be made to maintain and, if possible, increase the levels of each of these. For good plant growth, nitrogen must be added regularly in the form of leguminous organic matter, animal manure, commercial fertilizer, or some combination of these sources.

The structure of the plow layer of this soil breaks down easily. This tendency of the surface soil to pack and crust retards the intake and movement of water into the soil. Furthermore, the subsoil is slowly permeable. Favorable tilth of the surface soil may be maintained by adding organic matter regularly and by using recommended rotations containing grass and legumes.

#### *Erosion control*

Where this soil occurs on sloping areas, erosion is a major problem. Erosion can be controlled by using the practices listed in the table below with the recommended rotation. Note that with the more intense practices, shorter rotations are necessary to control erosion.

## Crop rotations

Most Intensive Crop Rotations Recommended for Soil Type 164 Occurring on Different Slopes and With Varying Depths to Subsoil

(See Part I for meaning of slope group and erosion or depth to subsoil symbols)

Slope group	Erosion or depth to subsoil	Land capability class <sup>1/</sup>	Crop rotations recommended for--			
			No practice	Contouring	Strip cropping	Terracing
A	0		R-R-G-M	On A slopes surface drainage may be needed		
B	0, 1		R-R-G-M-M	R-R-G-M	R-R-G-M-M-M	R-R-G-M
	2		R-G-M-M	R-R-G-M-M	R-R-G-M-M-M	R-R-G-M
C	2		G-M-M-M-M	R-G-M-M	R-R-G-M-M-M	R-R-G-M
	3		G-M-M-M-M	G-M-M-M-M	G-M-M-M-M	G-M-M-M-M

<sup>1/</sup> For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

R = Row crop; G = Small grain; M = Rotation hay or pasture; for example, a R-G-M-M rotation includes 1 year of row crops, 1 year of small grain, and 2 years of rotation hay or pasture in a 4-year period.

## Other Management Suggestions

The following suggestions apply to those areas to be used for permanent pasture, woodland, or wildlife:

### Permanent pasture

1. Apply limestone and fertilizer according to needs as indicated by soil tests.
2. Tear up old sod and reseed adapted legumes and grasses, such as Ladino clover, alsike clover, red clover, alfalfa, lespedeza, tall fescue, brome grass, timothy, and redtop.
3. Control grazing to maintain legume and grass stands and clip to control weeds.

### Woodland

1. Timber stands grow reasonably well on this soil; adequately-stocked, well-managed stands should grow 300 or more board feet per acre per year.
2. Manage existing stands to favor white oak, red oak, black oak, and yellow poplar, and protect from fire and grazing.
3. Harvest mature, defective, and less desirable trees unless they are needed to provide vegetative cover.
4. Plantations of shortleaf and loblolly pine grow very well on this soil, producing fence posts in 12 to 15 years and small saw logs in about 30 years.

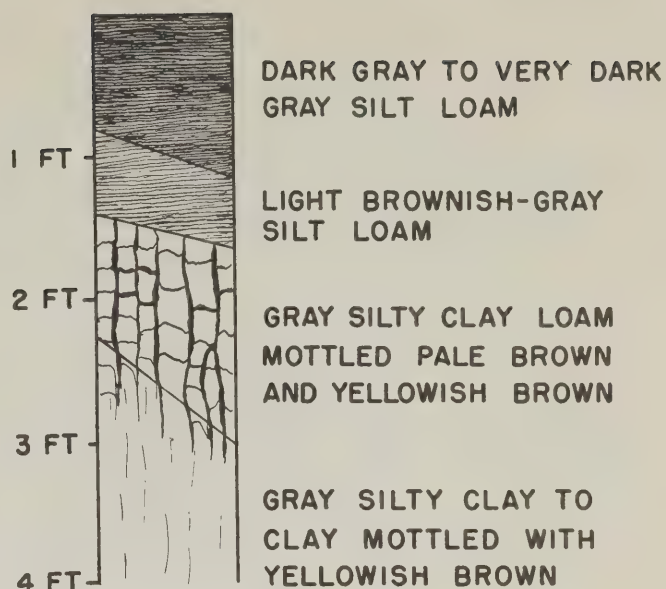
### Wildlife

1. Plant or keep odd areas, pond areas, field borders, and permanent fences to adapted trees, shrubs, or grasses and protect from fire and grazing.
2. Protect ground-nesting birds. Don't mow field borders until after small grain harvest.
3. Stock ponds of proper size and depth with bass and bluegills for fish production.

## USE AND MANAGEMENT OF SOIL TYPE:

### 176 – MARISSA SILT LOAM

Moderately dark-colored, poorly to imperfectly drained, medium-textured soil developed from thin (less than 24 inches) loess on water-deposited clay. Marissa occurs on nearly level to gently sloping, terrace areas in northwestern Williamson county.



### *Management Suggestions for Cropland*

Under good management Marissa is a productive soil. The major problems are drainage on nearly level areas, erosion control on gently sloping areas, and fertility and maintenance of tilth on all areas.

#### *Drainage*

Where Marissa occurs on nearly level areas, drainage is a problem. If suitable outlets are available, tile can be used satisfactorily. However, surface ditches may also be used with good results.

#### *Fertility and maintenance of tilth*

This soil is usually low in available phosphorus, medium to high in available potassium, and acid in reaction. Lime and phosphate are usually needed. Soil tests should be made and these nutrients applied according to recommendations.

Normally organic matter and nitrogen are about medium in this soil. Fresh supplies of organic matter should be maintained by regular additions of leguminous crops, animal manures, commercial fertilizers, or some combination of these sources.

This soil usually has good physical condition in the surface unless it is worked when too wet. Growing grasses and legumes regularly in the rotation will help to keep the surface soil granulated and porous to air and water. Keep livestock and machinery off during wet periods.

#### *Erosion control*

Erosion is not serious on this land. However, where this soil occurs on gentle slopes, it is subject to some loss of valuable topsoil unless conservation practices are used to prevent erosion.



## *Crop rotations*

Most Intensive Rotations Recommended for Soil Type 176 Occurring on Different Slopes and With Varying Depths to Subsoil

(See Part I for slope group and erosion or depth to subsoil symbols)

Slope group	Erosion or depth to subsoil	Land capability class <sup>1/</sup>	Crop rotations recommended for--			
			No practice	Contouring	Strip cropping	Terracing
A	0		R-R-G-M	Surface drainage may be needed		
B	1		R-R-G-M	R-R-G-M	R-R-G-M-M-M	R-R-G-M

<sup>1/</sup> For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

R = Row crop; G = Small grain; M = Rotation hay or pasture; for example, a R-G-M-M rotation includes 1 year of row crops, 1 year of small grain crops, and 2 years of rotation hay or pasture in a 4-year period.

## *Other Management Suggestions*

This soil is best suited for cropland and in most instances should be handled as such. However, some areas may be used for pasture, woodland, or wildlife, and in such cases the following suggestions apply:

### *Permanent pasture*

1. Apply limestone and fertilizer according to needs as indicated by soil tests.
2. Tear up old sod and reseed to adapted legumes and grasses.
3. Control grazing to maintain good stands of legumes and clip to control weeds.

### *Woodland*

1. This land is very seldom used for woodland.
2. If a desirable stand of trees is left, maintain them by harvesting mature, defective, and less desirable ones.
3. Keep fire and livestock out.

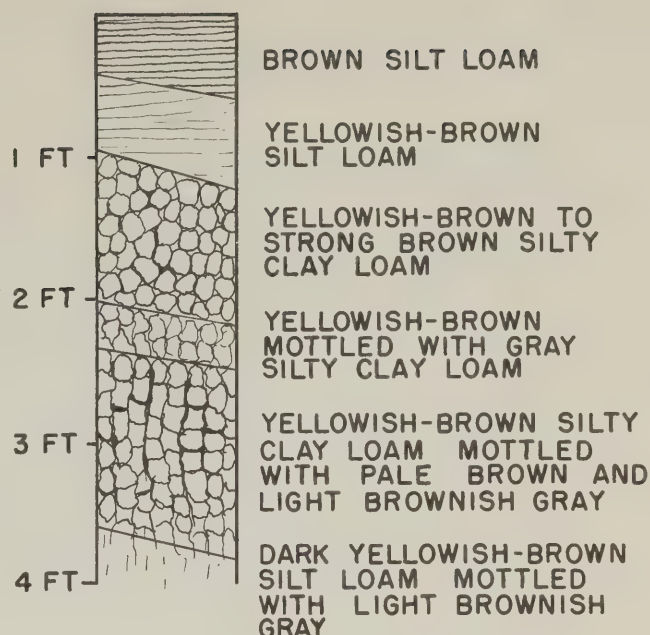
### *Wildlife*

1. Plant or keep odd areas, field borders, pond areas, etc., to adapted trees, shrubs, or grass and legumes.
2. Protect ground-nesting birds. Don't mow field borders until after small grain harvest time.
3. Protect from fire and grazing.

## USE AND MANAGEMENT OF SOIL TYPE:

### 214 – HOSMER SILT LOAM

Light-colored, moderately well-drained, medium-textured soil developed from loess over leached glacial till or over bedrock. A slight to moderately developed siltpan is present in the lower subsoil area. Hosmer occurs on gently sloping to steep, upland areas.



#### *Management Suggestions for Cropland*

Erosion control and maintenance of soil fertility are the major problems on this soil.

#### *Drainage*

Drainage is not a problem on this soil. However, water does not pass through the lower part of the subsoil as fast as is desirable.

#### *Fertility and maintenance of tilth*

This soil is usually low in available phosphorus, medium in available potassium, and acid in reaction. Soil samples should be tested and fertilizer and lime applied according to recommendations. Hosmer responds well to fertilizer treatment.

Organic matter and nitrogen are low and unless these materials are added regularly, crop yields will not be as high as they should be. Both organic matter and nitrogen may be provided by applying animal manure or by growing legumes and grasses. Nitrogen may also be added in commercial fertilizer.

Since the organic matter is low in this soil, any increase in this material will help the physical condition of the surface soil. Growing grasses and legumes regularly in the rotation is the best way to keep the surface soil porous to air and water.

#### *Erosion control*

Because of the varying degrees of slopes on which this soil occurs and the slow permeability of the lower part of subsoil to water, soil conservation practices, such as contouring, strip cropping, or terracing should be used where practicable. Natural waterways should be kept in permanent sod.

All crop residues should be returned to the soil.

## Crop rotations

Most Intensive Crop Rotations Recommended for Soil Type 214 Occurring on Different Slopes and With Varying Depths to Subsoil

(See Part I for meaning of slope group and erosion or depth to subsoil symbols)

Slope group	Erosion or depth to subsoil	Land capability class <sup>1/</sup>	Crop rotation or land use recommended for--			
			No practice	Contouring	Strip cropping	Terracing
B	1		R-R-G-M	R-R-G-M	R-R-G-M-M-M	R-R-G-M
	2		R-R-G-M-M	R-R-G-M-M	R-R-G-M-M-M	R-R-G-M
C	1		R-G-M-M	R-R-G-M-M	R-R-G-M-M-M	R-R-G-M
	2		R-G-M-M	R-R-G-M-M	R-R-G-M-M-M	R-R-G-M
	3		G-M-M-M-M	G-M-M-M-M	R-R-G-M-M-M	G-M-M-M-M
D	1		G-M-M-M-M	G-M-M-M-M	G-M-M-M-M	G-M-M-M-M
	2		G-M-M-M-M	G-M-M-M-M	G-M-M-M-M	G-M-M-M-M
	3		Pasture or woodland			
	4					
E	1		Pasture or woodland			
	2					
	3					
	4					
F	2		Pasture or woodland			
	3					

<sup>1/</sup> For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

R = Row crop; G = Small grain; M = Rotation hay or pasture; for example, a R-G-M-M rotation includes 1 year of row crops, 1 year of small grain, and 2 years of rotation hay or pasture in a 4-year period.

## Other Management Suggestions

The following suggestions are made to get the maximum benefits from areas best suited for permanent pasture, woodland, or wildlife:

### Permanent pasture

1. Apply lime and fertilizers according to the needs as indicated by soil tests.
2. Tear up old sod and reseed adapted legumes and grasses, such as Ladino clover, alfalfa, birdsfoot trefoil, red clover, lespedeza, tall fescue, brome grass, timothy, and redtop.
3. On steep, eroded areas, cultivate only enough to renew pasture stands.
4. Clip weeds and regulate grazing to maintain legume and grass stands.

### Woodland

1. This soil is very productive for forest; adequately-stocked stands of desirable species such as white oak, red oak, and black oak will grow up to 500 board feet per acre per year when properly managed.
2. Harvest mature, defective, and less desirable trees such as hickory, maple, and elm unless they are needed to provide vegetative cover.
3. Protect from fire and grazing.
4. Plantations of shortleaf pine and loblolly pine, if properly managed, will produce fence post material in 12 to 15 years and small saw logs in about 30 years.
5. Scotch pine and red pine may be planted for Christmas trees.

### Wildlife

1. Plant or keep odd areas, pond areas, field borders, and permanent fences to adapted trees, shrubs, or grasses and legumes.
2. Protect from fire and grazing.
3. Protect ground-nesting birds and don't mow field borders until after small grain harvest time.
4. Stock suitable ponds with fish.

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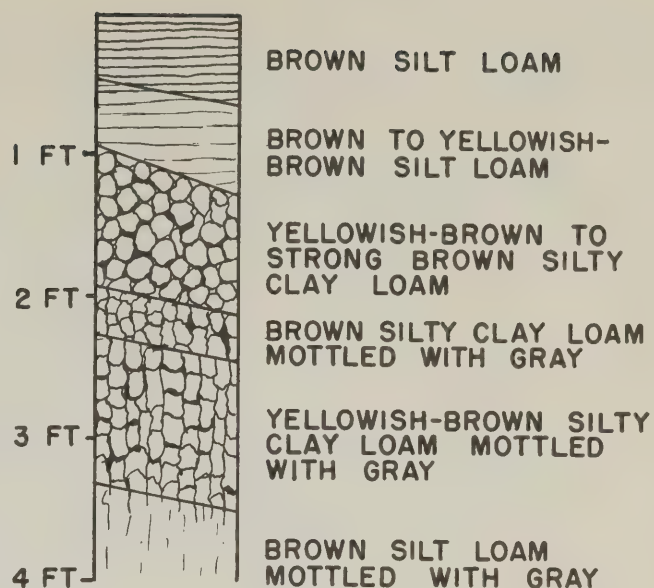
Soil Conservation Service, United States Department of Agriculture



## USE AND MANAGEMENT OF SOIL TYPE:

### 301 – GRANTSBURG SILT LOAM

Light-colored, moderately well-drained, medium-textured soil developed from loess over bedrock. A moderately to strongly developed siltpan is present in the lower subsoil. Grantsburg occurs on gently sloping to steep, upland areas.



### *Management Suggestions for Cropland*

Erosion control and maintenance of soil fertility are the major problems on this soil.

#### *Drainage*

Drainage is not a serious problem on this soil, although water does not pass through the lower part of the subsoil as fast as is desirable.

#### *Fertility and maintenance of tilth*

Grantsburg is usually low in available phosphorus, low to medium in available potassium, and acid in reaction. Soil tests should be made and lime and fertilizer applied according to recommendations. Grantsburg responds well to good management.

Organic matter and nitrogen are low. Unless these materials are added regularly, crop yields will be low. Both organic matter and nitrogen may be provided by applying animal manure or by growing legumes and grasses. Nitrogen may also be applied as commercial fertilizer.

Organic matter will also help the physical condition by opening up the surface soil for better water infiltration. Also, it will make the surface easier to work.

#### *Erosion control*

Because of the varying degrees of slope on which this soil occurs, soil conservation practices, such as contouring, strip cropping, or terracing should be used where practical.

Natural waterways should be kept in permanent sod.

All crop residues should be returned to the soil.

## Crop rotations

Most Intensive Rotations Recommended for Soil Type 301 Occurring on Different Slopes and With Varying Depths to Subsoil

(See Part I for meaning of slope group and erosion or depth to subsoil symbols)

Slope group	Erosion or depth to subsoil	Land Capability class <sup>1/</sup>	Crop rotations and land use recommended for--			
			No practice	Contouring	Strip cropping	Terracing
B	1		R-R-G-M	R-R-G-M	R-R-G-M-M-M	R-R-G-M
	2		R-R-G-M-M	R-R-G-M	R-R-G-M-M-M	R-R-G-M
C	1		R-G-M-M	R-R-G-M-M	R-R-G-M-M-M	R-R-G-M
	2		R-G-M-M	R-R-G-M-M	R-R-G-M-M-M	R-R-G-M
	3		G-M-M-M-M	G-M-M-M-M	G-M-M-M-M	G-M-M-M-M
D	1		G-M-M-M-M	G-M-M-M-M	G-M-M-M-M	G-M-M-M-M
	2		Pasture or woodland	G-M-M-M-M	G-M-M-M-M	G-M-M-M-M
	3					
	4			Pasture or woodland		
E	2					
	3			Pasture or woodland		
	4					

<sup>1/</sup> For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

R = Row crop; G = Small grain; M = Rotation hay or pasture; for example, a R-G-M-M rotation includes 1 year of row crops, 1 year of small grain crops, and 2 years of rotation hay or pasture in a 4-year period.

## Other Management Suggestions

Where this soil occurs on rather steep slopes, it is best suited for permanent pasture, woodland, or wildlife.

The following suggestions are made to get maximum benefits where this land is used for these purposes:

### Permanent pasture

1. Apply lime and fertilizers according to needs as indicated by soil tests.
2. Tear up old sod and reseed adapted legumes and grasses, such as Ladino clover, alfalfa, birdsfoot trefoil, red clover, lespedeza, tall fescue, brome grass, timothy, and redtop.
3. Clip weeds and regulate grazing to maintain legume and grass stands.

### Woodland

1. This soil is very productive for forest; adequately-stocked stands of desirable species such as white oak, red oak, and black oak will grow up to 500 board feet per acre per year when properly managed.
2. Harvest mature, defective, and less desirable trees such as hickory, maple, and elm unless they are needed to provide vegetative cover.
3. Protect from fire and grazing.
4. Plantations of shortleaf pine and loblolly pine, if properly managed, will produce fence post material in 12 to 15 years and small saw logs in about 30 years.
5. Scotch pine and red pine may be planted for Christmas trees.

### Wildlife

1. Plant or keep odd areas, pond areas, field borders, and permanent fences to adapted trees, shrubs, or grasses and legumes and protect from fire and grazing.
2. Protect ground-nesting birds. Don't mow field borders until after small grain harvest time.
3. Stock suitable ponds with fish.

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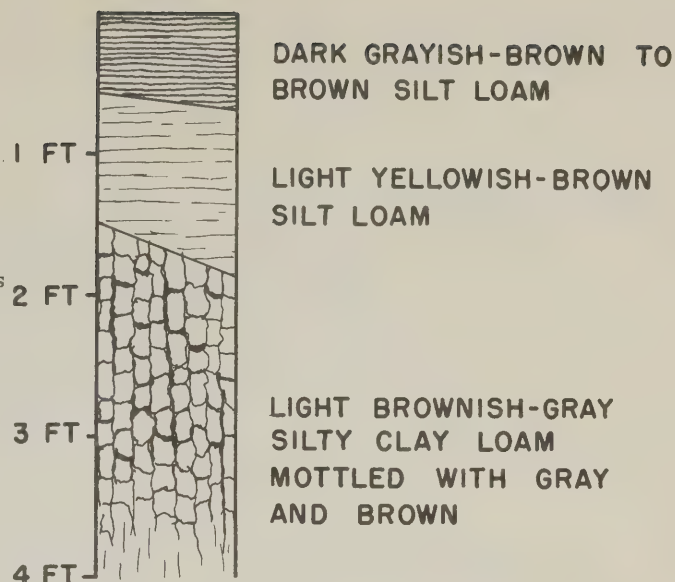
Soil Conservation Service, United States Department of Agriculture

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## USE AND MANAGEMENT OF SOIL TYPE:

### 335 – ROBBS SILT LOAM

Light-colored, imperfectly drained, medium-textured soil developed from loess over bedrock. Robbs occurs on nearly level to gently sloping, upland areas.



#### *Management Suggestions for Cropland*

Drainage on nearly level areas, erosion control on sloping areas, and soil fertility are the major problems on this soil.

#### *Drainage*

Water normally moves through this soil slowly and, therefore, nearly level areas may stay wet and waterlogged for longer periods than are desirable. Surface ditches are recommended to provide drainage on this soil.

#### *Fertility and maintenance of tilth*

This soil is acid, low in available phosphorus, and low to medium in available potassium. Soil tests should be made to determine the amounts of each of these elements needed, and lime and fertilizer should be applied accordingly.

Organic matter and nitrogen are low. These materials should be added regularly for good crop yields. Both organic matter and nitrogen may be provided by applying animal manure and by growing legumes and grasses. Nitrogen may also be added by commercial fertilizers.

When grass and legumes are not used in the rotations, the structure in the surface soil tends to break down and run together retarding the intake and movement of water and air in the soil. Furthermore, the subsoil is slowly permeable to water. Favorable tilth of the surface soil may be maintained by adding organic matter regularly in the form of grass and legume crops.

#### *Erosion control*

Where this soil occurs on sloping areas, erosion control is a major problem. Erosion can be controlled by using the conservation practices listed in the table below along with the recommended rotation.



### ***Other Management Suggestions***

When Hurst is used for permanent pasture, woodland, or wildlife, the following suggestions apply:

#### *Permanent pasture*

1. Apply limestone and fertilizer according to needs as indicated by soil tests.
2. Tear up old sod and reseed adapted legumes and grasses, such as Ladino clover, birdsfoot trefoil, tall fescue, timothy, and redtop.
3. Control grazing to maintain legume stands and clip to control weeds.

#### *Woodland*

1. This soil is not particularly good for timber production; growth rates in adequately-stocked, well-managed stands should vary from 100 to 200 board feet per acre per year.
2. Where stands exist, favor black oak, red oak, and post oak, and protect from fire and grazing.
3. Harvest mature, defective, and less desirable trees such as hickory, black jack oak, and ash.

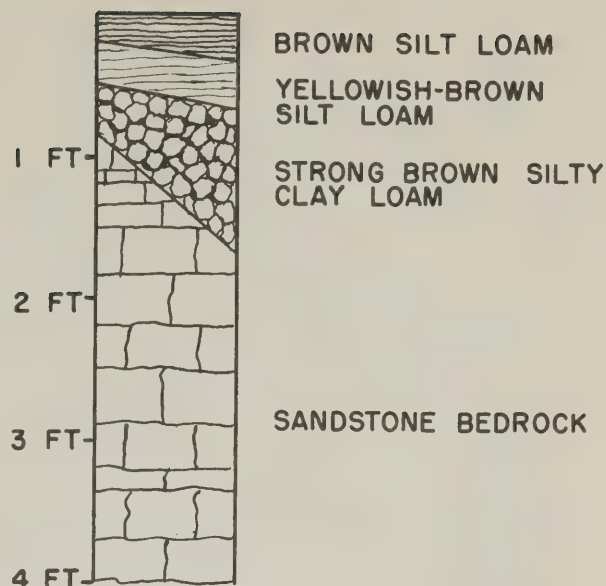
#### *Wildlife*

1. Plant or keep odd areas, field borders, etc., to adapted trees, shrubs, or grasses and legumes.
2. Protect ground-nesting birds. Don't mow field borders until after small grain harvest time.
3. Protect all wildlife areas from fire and grazing.

## USE AND MANAGEMENT OF SOIL TYPE:

### 339 – WELLSTON SILT LOAM

Light-colored, well-drained, medium-textured soil developed from 10 to 20 inches of loess over sandstone bedrock. Wellston occurs on very steeply sloping, up-land areas.



#### *Management Suggestions*

Erosion control and maintenance of soil fertility are the major problems on this soil. Wellston is better adapted for pasture or woodland than for cropland.

#### *Drainage*

Drainage is seldom a problem on this soil. Very occasionally small areas may be wet because of seepage just above the bedrock.

#### *Fertility and maintenance of tilth*

This soil is acid, very low in available phosphorus, and high in available potassium. Soil tests should be made and fertilizer and lime applied according to recommendations. Wellston responds well to fertilizer treatment.

Organic matter and nitrogen are low. Unless these materials are added regularly, yields will not be as high as is practical. Both organic matter and nitrogen may be provided by applying animal manure or by growing legumes and grasses.

#### *Erosion control*

Maintaining this land in the correct land use is most important in controlling erosion. Recommended conservation practices must be used to keep soil losses, because of erosion, within reasonable limits.

#### *Crop rotations*

Since this soil is shallow to bedrock and occurs on slopes of 7 percent or greater, it is best suited for hay, pasture, woodland, or wildlife.

Row crops should not be grown on this land more often than 1 year out of 5 or 6 years. When a row crop or small grain crop is used to reestablish the legume and grass, it should be confined to slopes of less than 12 percent. The row crop should be planted on the contour or contour strip cropping should be used.

Most Intensive Crop Rotations Recommended for Soil Type 339 Occurring on Different Slopes and With Varying Depths to Subsoil

(See Part I for meaning of slope group and erosion or depth to subsoil symbols)

Slope group	Erosion or depth to subsoil	Land capability class <sup>1/</sup>	Crop rotations and land use recommended for—			
			No practice	Contouring	Strip cropping	Terracing
D	2		Pasture or woodland	G-M-M-M-M	G-M-M-M-M	Pasture or woodland
	3			Pasture or woodland	G-M-M-M-M	
E	2		Pasture or woodland			
	3					
	4					
F	2		Pasture or woodland			
	3					
	4					
G	2		Pasture or woodland			
	3					

<sup>1/</sup> For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

R = Row crop; G = Small grain; M = Rotation hay or pasture; for example, a R-G-M-M rotation includes 1 year of row crops, 1 year of small grain, and 2 years of rotation hay or pasture in a 4-year period.

When Wellston is used for permanent pasture, woodland, or wildlife, the following recommendations apply:

*Permanent pasture*

1. Apply limestone and fertilizer according to needs as indicated by soil tests.
2. Tear up old sod and reseed adapted legumes and grasses, such as Ladino clover, alfalfa, alsike clover, red clover, lespedeza, birdsfoot trefoil, tall fescue, bromegrass, timothy, and redtop.
3. Control grazing to maintain legume and grass stands and clip to control weeds.

*Woodland*

1. Adequately-stocked stands that are managed properly should produce up to 250 board feet per acre per year.
2. In the management of existing stands, favor white oak, red oak, and black oak, and cut mature, defective, or less desirable trees such as maple, hickory, elm, and black gum.
3. Protect from fire and grazing.
4. Areas that have been abandoned for cultivation and are not heavily covered with brush may be planted to shortleaf pine or loblolly pine.

*Wildlife*

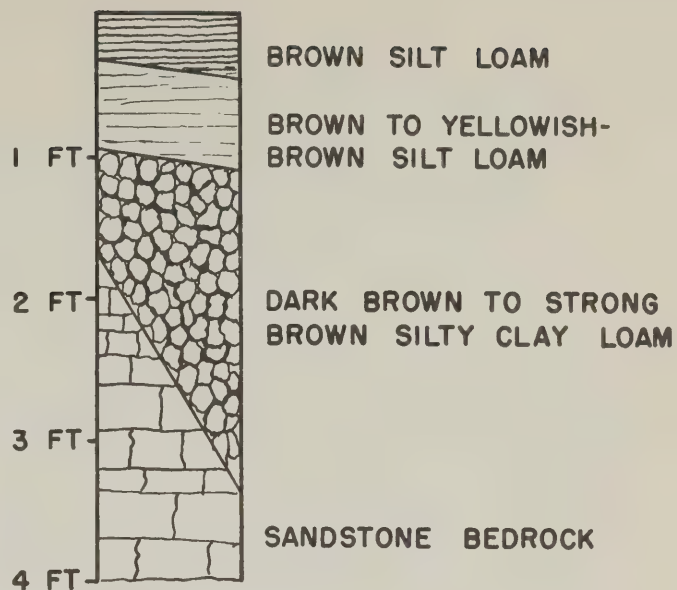
1. Plant or keep odd areas, pond areas, field borders, and permanent fences to adapted trees, shrubs, legumes, and grasses and protect from fire and grazing.
2. Protect ground-nesting birds by not mowing field borders until after small grain harvest.
3. Stock ponds of proper size and depth with adapted fish.



## USE AND MANAGEMENT OF SOIL TYPE:

### 340 – MANITOU SILT LOAM

Light-colored, moderately well- to well-drained, medium-textured soil developed from 20 to 40 inches of loess over sandstone bedrock. Manitou occurs on steeply sloping, upland areas.



#### Management Suggestions

Erosion control and maintenance of soil fertility are the major problems on this soil. Manitou is better adapted for pasture or woodland than for cropland.

##### *Drainage*

Drainage is seldom a problem on this soil. Occasionally in small areas, because of shallow depths to bedrock, seepage may be a problem.

##### *Fertility and maintenance of tilth*

This soil is acid, low in available phosphorus, and medium to high in available potassium. Soils should be tested and fertilizer and lime applied according to recommendations. Manitou responds well to fertilizer treatment.

Organic matter and nitrogen are low. Unless these materials are added regularly, crop yields will be disappointingly low. Both organic matter and nitrogen may be provided by applying animal manure or by growing legumes and grasses. Nitrogen may also be added by the use of commercial fertilizers.

##### *Erosion control*

Because of the steep slopes on which this soil is found, it is best suited for hay, pasture, woodland, or wildlife. Unless it is used for one of these purposes, it is almost impossible to control erosion and grow profitable crops.

##### *Crop rotations*

Since this soil occurs on slopes of 7 percent or greater, it should be in close growing legumes and grasses most of the time. Because of the slope and shallow depth of soil to bedrock, row crops should not be grown more often than once in 5 or 6 years. By the use of terraces on slopes of less than 12 percent, 1 row crop and 1 small grain crop may be grown in 5 or 6 years. In the following table on crop rotations for different slopes and erosion, or depth to subsoil, the most intensive crop rotations or land use recommended are given.

**Most Intensive Crop Rotations Recommended for Soil Type 340 Occurring on Different Slopes and With Varying Depths to Subsoil**

(See Part I for meaning of slope group and erosion or depth to subsoil symbols)

Slope group	Erosion or depth to subsoil	Land capability class <sup>1/</sup>	Crop rotations and land use recommended for--				
			No practice	Contouring	Strip cropping	Terracing	
D	1		Pasture or woodland	G-M-M-M-M	G-M-M-M-M	R-G-M-M-M	
	2			G-M-M-M-M	G-M-M-M-M	R-G-M-M-M	
	3			Pasture or woodland			
	4						
E	2		Pasture or woodland				
	3						
	4						
F	2		Pasture or woodland				
	3						

<sup>1/</sup> For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.

R = Row crop; G = Small grain; M = Rotation hay or pasture; for example, a R-G-M-M rotation includes 1 year of row crops, 1 year of small grain, and 2 years of rotation hay or pasture in a 4-year period.

Because Manitou responds favorably to applications of fertilizer and lime, good stands of grasses and legumes can be maintained. On slopes of 12 percent or steeper, Manitou is best suited for pasture, woodland, or wildlife.

For these purposes the following recommendations apply:

*Permanent pasture*

1. Apply limestone and fertilizer according to needs as indicated by soil tests.
2. Tear up old sod and reseed adapted legumes and grasses, such as Ladino clover, alfalfa, alsike clover, red clover, lespedeza, tall fescue, brome grass, timothy, and redbud.
3. Control grazing to maintain legume and grass stands and clip to control weeds.

*Woodland*

1. On this soil growth rate of native hardwood stands which are adequately stocked and managed well, may reach 300 board feet per acre per year.
2. In the management of existing stands, favor white oak, black oak, and red oak, and protect from fire and grazing.
3. Harvest mature, defective, or less desirable trees such as maple, hickory, and elm.
4. Shortleaf pine and loblolly pine are desirable species to plant on eroded areas that are no longer cultivated. They will produce fence post material in 12 to 15 years and small saw logs in about 30 years. Fence posts must be treated since the wood of these species is not durable.

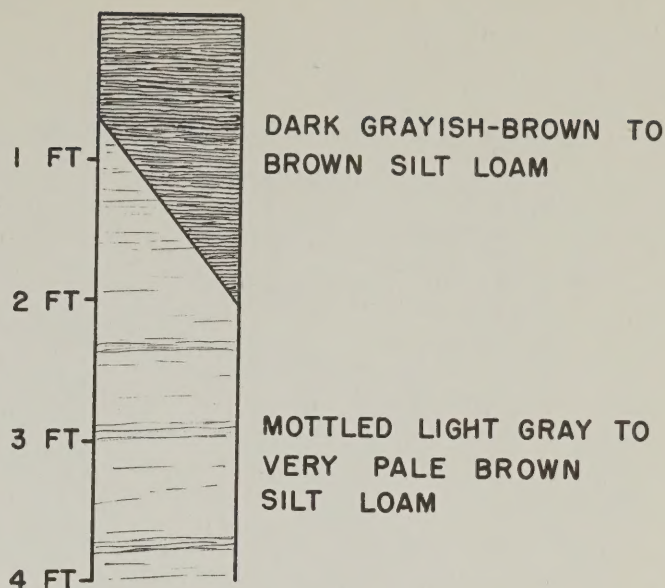
*Wildlife*

1. Plant or keep odd areas, pond areas, field borders, and permanent fences to adapted trees, shrubs, legumes, and grasses and protect from fire and grazing.
2. Protect ground-nesting birds by not mowing field borders until after small grain harvest.
3. Stock ponds of proper size and depth with adapted fish.

## USE AND MANAGEMENT OF SOIL TYPE: \*

### 382 - BELKNAP SILT LOAM

Light-colored, imperfectly drained, medium-textured bottomland soil.



### *Management Suggestions for Cropland*

The major problems on Belknap are drainage and overflow, and fertility and maintenance of tilth.

#### *Drainage*

Overflow is sometimes a serious hazard on Belknap. Diversion ditches are helpful to intercept water from nearby hills.

Drainage is a problem on many areas of Belknap in that the subsurface soil will not allow the water to pass through as fast as desirable. Also, a high water table often exists and tends to keep the surface soil wet and waterlogged late in the spring. Surface ditches are usually recommended to carry off excess water. Tile will function satisfactorily under good management. However, with good surface ditches, it is very seldom necessary to use tile.

#### *Fertility and maintenance of tilth*

This soil is acid and low in available phosphorus and available potassium. Lime and fertilizer should be applied according to recommendations based on soil tests. If adequately drained, Belknap responds well to fertilizer and lime.

Organic matter and nitrogen are low to medium. For high crop yields, nitrogen must be applied regularly. Good sources of organic matter and nitrogen are grass and leguminous crops (when overflow hazard is not too frequent) and animal manure. Nitrogen may also be applied by commercial fertilizers.

The use of a sod crop periodically in the rotation is one of the best ways to keep the surface soil in good physical condition. Also, since this soil packs easily when wet, livestock and heavy machinery should not be allowed on it during wet periods.

#### *Erosion control*

Erosion control is not a problem on Belknap, although in some areas stream-bank cutting may be serious.

\* This soil type is included in Land Capability Class

For an explanation of Land Capability Classes, see your local Soil Conservation Service personnel.



### *Crop rotations*

Use a rotation including 1 year of grass and legumes in 4 years, such as corn, soybeans, wheat, and grass and legumes, or include a catch crop every third or fourth year when manure or nitrogen is applied.

When the overflow hazard is too frequent for small grain crops or standover legume crops, a catch crop seeding during the last cultivation of corn might help to maintain organic matter and good physical condition.

Crop residues should be returned to the soil.

### *Other Management Suggestions*

This is good cropland, but it is sometimes used as pasture, woodland, or wildlife. When used for these purposes, the following recommendations apply:

#### *Permanent pasture*

1. Test the soil and apply lime and fertilizer as recommended.
2. Seed with grasses and legumes that are adapted to wet soil conditions, such as tall fescue, redbud, Ladino clover, and alsike clover.
3. On areas that are very wet or subject to serious overflow, reed canary grass will usually produce good forage.

#### *Woodland*

1. This soil is fair for timber production; well-stocked stands should produce from 400 to 500 board feet per acre per year.
2. In the management of existing stands, favor oak (wet site species), sweet gum, sycamore, cottonwood, and soft maple.
3. Harvest mature, defective, and less desirable trees such as willow and honey locust.
4. Protect from fire and grazing.

#### *Wildlife*

1. For wildlife, seed ditch banks, odd areas, and field borders to adapted legumes and grasses.
2. Prevent fire and grazing.

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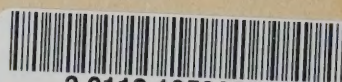
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